Plates.—Drawings of McKim, Mead and White, and Wilson Eyre, Jr.

THE BRICKBVILDER

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APR 27 1896
CITY OF WASHINGTON

DEVOTED TO THE INTERESTS OF

ARCHITECTVRE IN MATERIALS OF CLAY

PUBLISHED MONTHLY.

85 WATER STREET, BOSTON, MASS.

VOLVME FIVE

APRIL MDCCCXCVI

NVMBER FOUR

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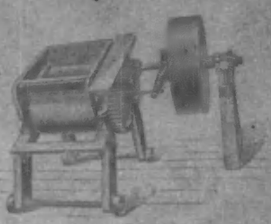

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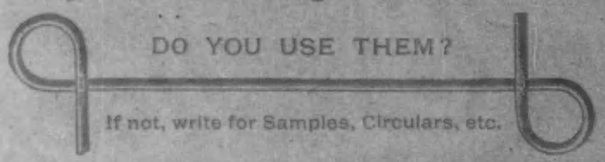

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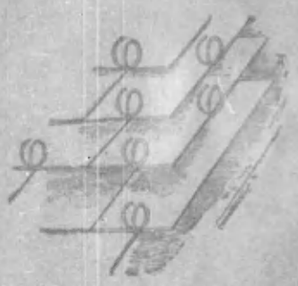

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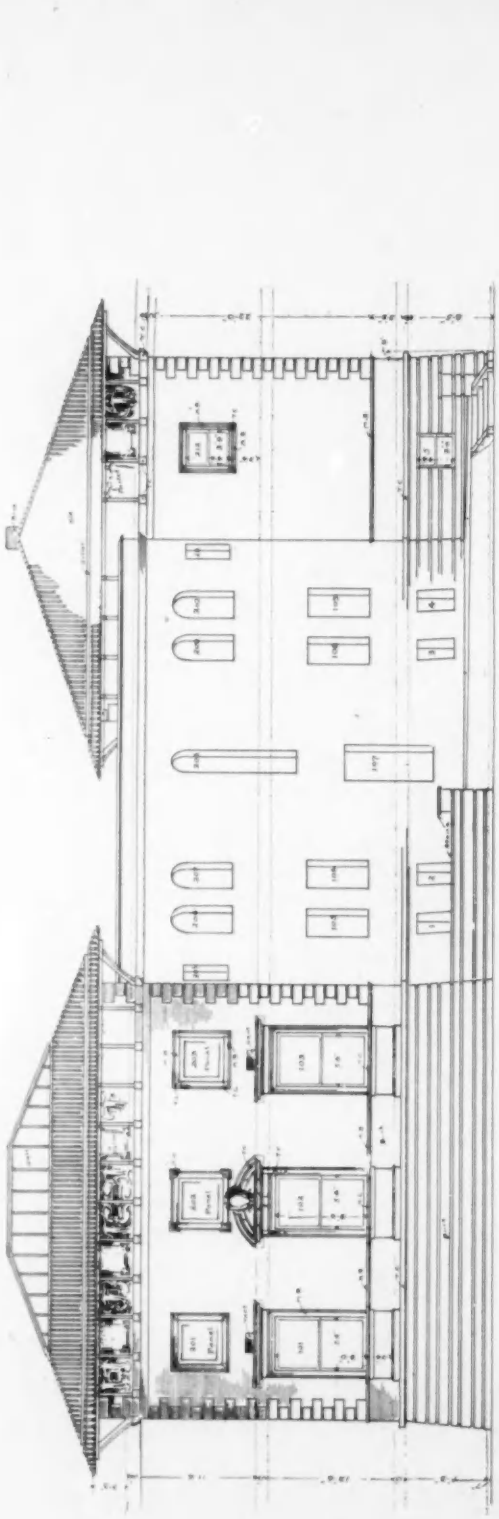
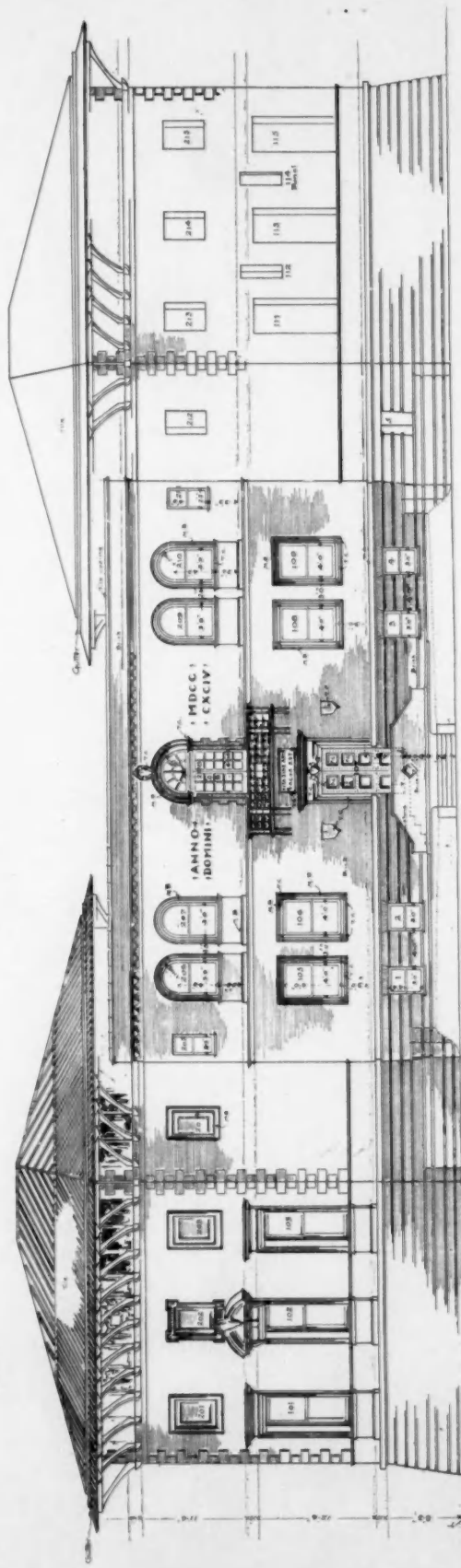


South-west Elevation



South Elevation

ART BUILDING FOR H. SOPHIE NEWCOMB MEMORIAL COLLEGE, NEW ORLEANS, LA.

WILSON EYRE, JR., ARCHITECT.

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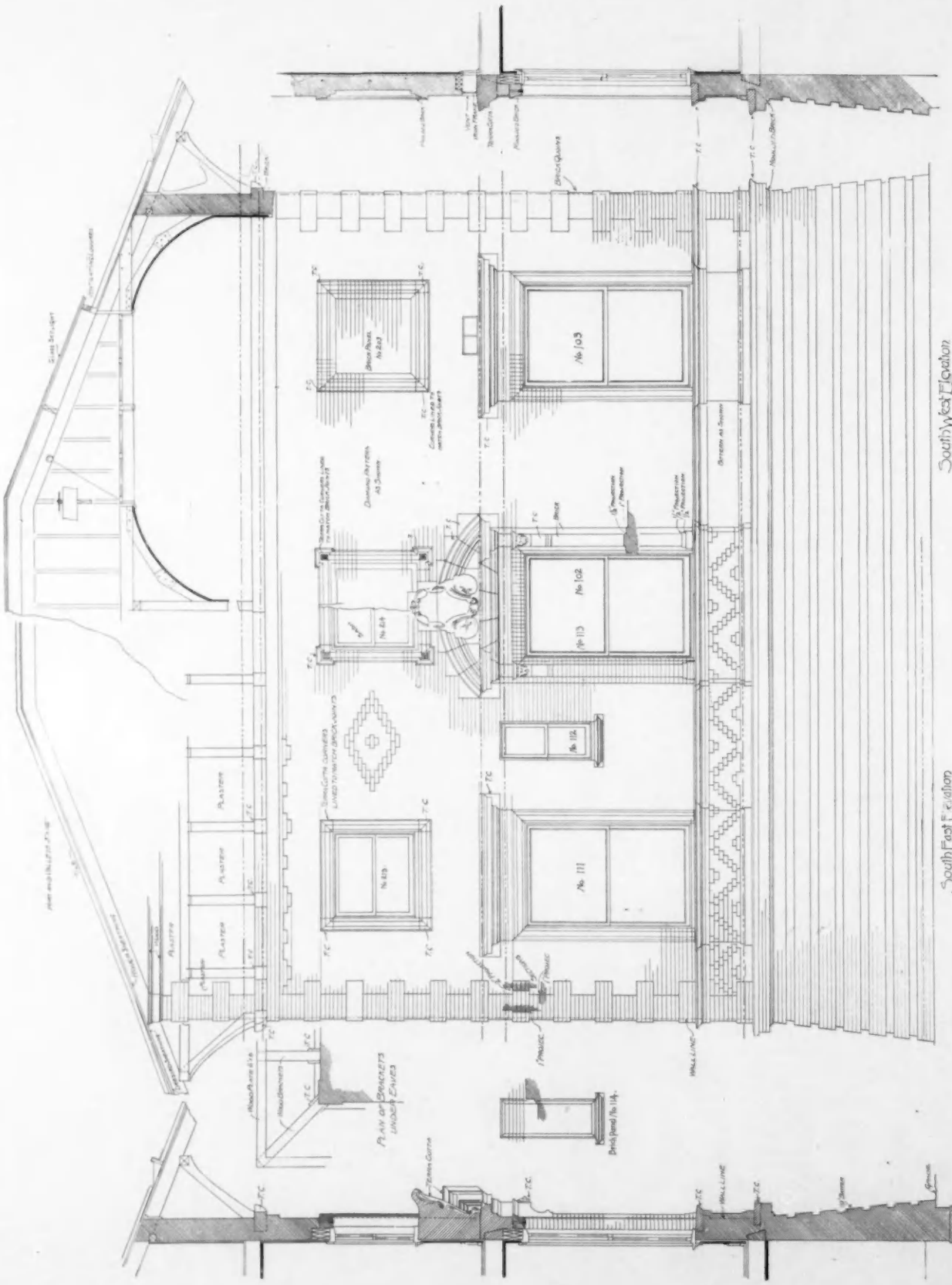


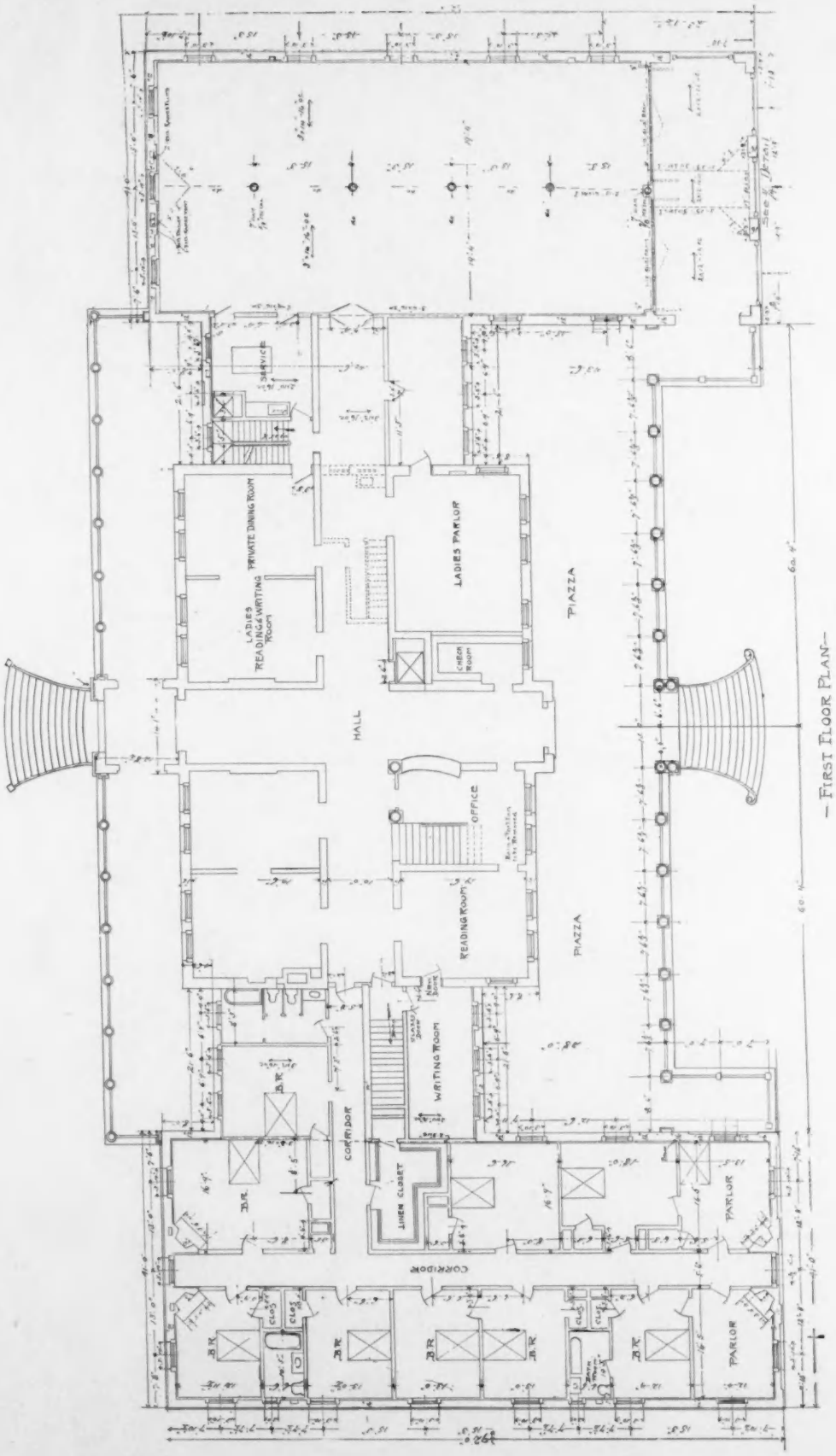
ART BUILDING FOR H. SOPHIE NEWCOMB MEMORIAL COLLEGE, NEW ORLEANS, LA
WILSON EYRE, JR., ARCHITECT.

FRONT ELEVATION

GARDEN CITY HOTEL, GARD
McKIM, MEAD & WHITE.

EVATION.

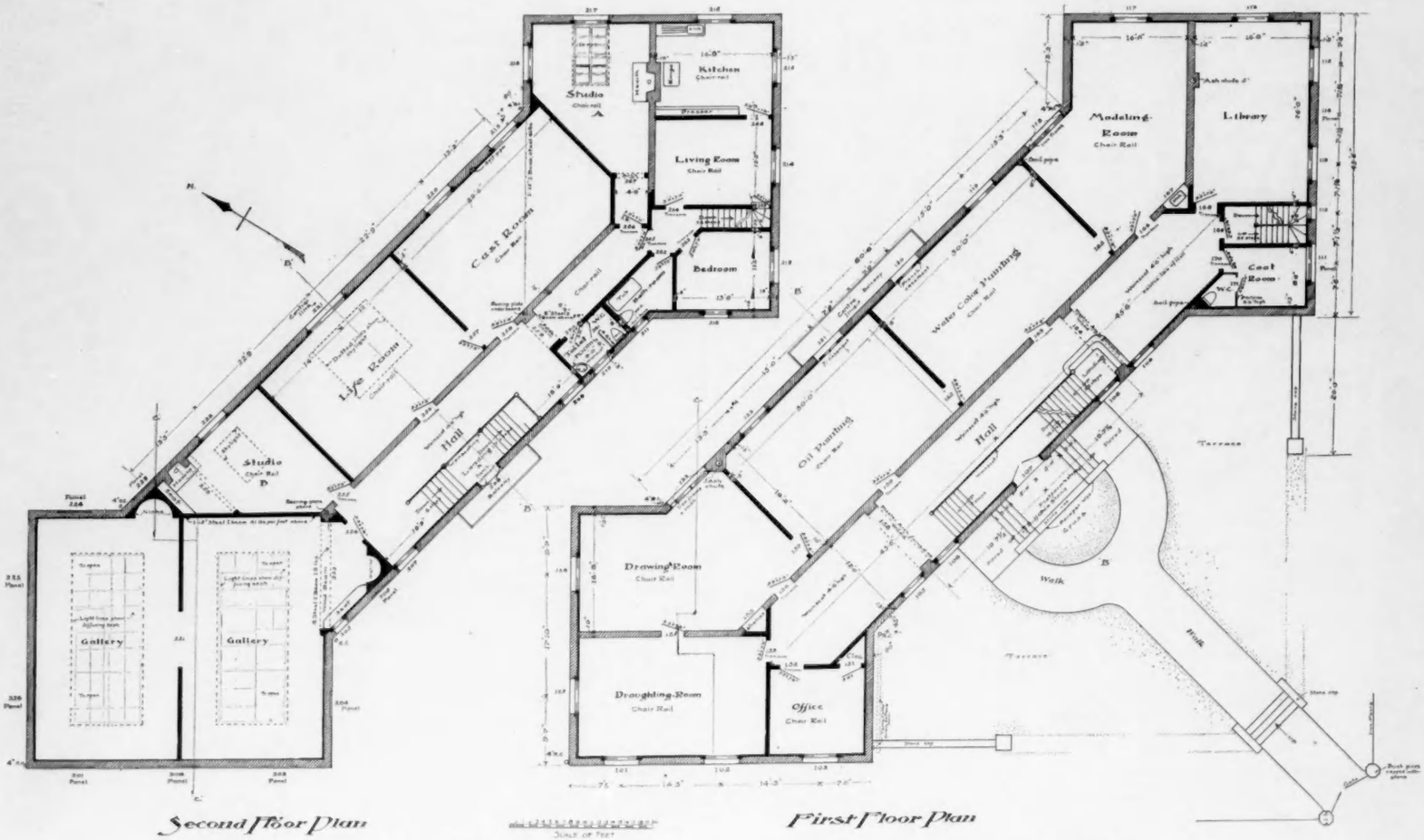
OTEL, GARDEN CITY, L. I.,
AD & WHITE, Architects.



— First Floor Plan —

GARDEN CITY HOTEL, GARDEN CITY, L. I.

McKIM, MEAD & WHITE, Architects.



Second Floor Plan

First Floor Plan

ART BUILDING FOR H. SOPHIE NEWCOMB MEMORIAL COLLEGE, NEW ORLEANS, LA.

WILSON EYRE, JR., ARCHITECT.

VOLVME V APRIL 1896 No. 4

THE BRICKBVILDER

OFFICE 85 WATER STREET BOSTON

THE BRICKBUILDER.

AN ILLUSTRATED MONTHLY DEVOTED TO THE ADVANCEMENT OF ARCHITECTURE IN MATERIALS OF CLAY.

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PRICE *vs.* QUALITY.

THERE is a tendency of the present market for face brick which ought to be carefully considered by our manufacturers, namely, a willingness to cut prices, which results in emulation of price rather than quality. We do not mean that good bricks are not manufactured; quite the reverse is true, but the price seems to be insisted upon as much as the quality, and the man who can make the best brick for the least money seems to think he has a stronger claim on the public consideration than the one who simply makes the best brick he knows how and charges all he can get for it. We believe this basis is radically wrong; furthermore, we do not believe that it is a necessary one, nor that it really commands any better trade or any larger orders. The price of the face brick is not a very important factor in the cost of a large building, since the total amount which is used is so slight in reference to the general quantity of material that a difference of a few dollars per thousand one way or the other is very seldom considered by either the architects or the owners. We had occasion, recently, to go over the figures of a large commercial building in this city, the exterior walls of which were faced entirely with a high grade of pressed brick for a length of about 200 ft. and a height of 70 ft., requiring altogether somewhat less than 100,000 face brick, the value of which at the prices paid was about $4,000, while the total cost of the building was nearly $300,000. Conversing with the parties who supplied the brick, we were told that a special price was made of $40 a thousand being a cut of about $6 a thousand, which was voluntarily offered by the manufacturer in the hope that that would decide in favor of his particular brick. Talking the matter over later with the architect, however, we found that that cut had been entirely unnecessary; that that particular brick would have been used in any case, and that the difference of $600 was not considered a particle in making the selection; in other words, that $600 might just as well have been in the pockets of the manufacturers.

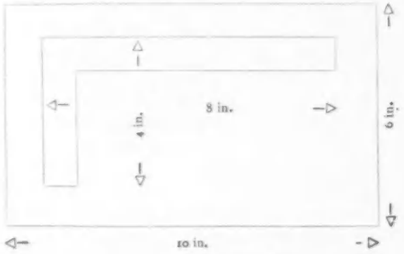
THIS is by no means an isolated case. We believe in most instances architects do not consider the price of face bricks at all, but rather select what seems to them the best for the purpose and order that brick used, a difference of a few dollars per thousand not being a determining factor. If this is a fact, and we see no reason to doubt it, the mistaken policy of undertaking to cheapen a product or to cut prices is fully demonstrated; and if our brick manufacturers would make up their mind hereafter to make the very best bricks they can produce, and sell them for the most money that the architects and the owners would submit to, we believe there would be a great deal less dissatisfaction with the product, and the difference in cost would count no more than it does now, while there would be a very tangible encouragement given to the improvement of the best and most available building material which we have at hand. All bricks are by no means good bricks, and though all manufacturers may know how to achieve the best results, there is a woful difference in the quality of the resulting product. We have extended our range of colors, we have multiplied indefinitely our varieties of forms and to the credit of the manufacturers it can be said that there have been many excellent bricks put on the market, but there seems to be a timidity in charging a good round price for a first-class article; a feeling that the purchaser and the architect will object to the price and that more bricks will be sold by making them cheap than by strictly adhering to what the material is fairly worth. Now, no manufacturer can keep on in business unless he receives a fair price for his product. If we were discussing bricks of all sorts, including common bricks, the point would have less value; but where the entire amount of face brick for a large building cuts relatively so slight a figure, it seems the part of folly for manufacturers to deliberately curtail their own profits with the infallible result in the end of being obliged to lessen the quality of the material or be driven out of business.

WE must admit, however, that there is another side of this question. Architects are too inclined to disregard the intrinsic qualities of the brick and to select simply the make which pleases in color or texture. Consequently, in some cases, an inferior brick is sold at a large profit where a better quality of brick, even at the same price, is not considered. If our architects would insist more rigidly upon the quality, irrespective of price, or considering price only last of all, and would endeavor to secure the very best the market affords, and if also our manufacturers would persistently put forth only their best efforts, would stand on the high ground that they are making a first-class article and are entitled to a high price for it, and that the best is none too good, there would then be an opportunity for a genuine revival in the clay industries which would mean not only better business, better profits, and a more legitimate trade for the manufacturers, but would imply buildings better built, better looking, and more enduring for the architect and the owners.

This is a point which the producers must take to heart. The safe course does not lie along any middle line. The manufacturer, in order to make money, must either turn out a lot of very cheap brick or else a more restricted quantity of very high grade brick, and judging from all our observations, and from what has been told us by manufacturers and architects generally throughout the country, we believe that the best product which the manufacturers can turn out will, in the long run, meet with the better success, will be more satisfactory to every one, and will be more generally used, and this is entirely independent of any consideration of price. We would not mean that manufacturers are to continue making poor bricks and simply put up the price, but if they will take the stand that their goods are the best and will prove it by their products, charging a good reasonable profit therefor, there will be no need of ever cutting their prices or resorting to cheap expedients to obtain the desired results.

The Barta Press Competition.

PROGRAM.



WE are authorized by The Barta Press, Boston, to announce a competition for designs for ornamental borders to be used in connection with display printing. These borders should be designed so that they can be adapted to various sizes of pages, and should also be of a nature which will permit of portions being used separately as head or tail pieces at the beginning or ending of paragraphs or pages; consequently, the patterns, while complete in themselves, should be such that will repeat and reverse. The average width of the pattern should not exceed ½ in., and the design should be of a sufficiently bold character to permit of photographic reproduction. The drawings must be made in line with black ink on sheets cut to a uniform size of 6 ins. by 10 ins., and the design should include a corner and 8 ins. of the pattern across the top and 4 ins. of the side, as indicated by the diagram, so as to give a complete idea of the design. For the best designs there is offered a first prize of $50; a second prize of $25; a third prize of $15; a fourth prize of $10; and a fifth prize of $5. The prizes will be awarded by a jury of three architects of acknowledged reputation. Each drawing must be marked with a motto or cipher, and a sealed envelope similarly marked and containing the full name of the designer must accompany the drawings. These envelopes will not be opened until after the award is made. After the judges have made their awards, The Barta Press shall have the privilege of selecting for their exclusive use fifteen or more of the designs that are not prize winners, for which will be given the choice of one volume of Bates, Kimball & Guild's "Details of Decorative Sculpture, French Renaissance," or "Details of Decorative Sculpture, Italian Renaissance." Drawings must be delivered flat, express or postage prepaid, at the office of THE BRICKBUILDER, not later than July 1.

The high character of the work which is turned out by The Barta Press has been so abundantly manifested in the pages of this journal as to need little additional comment. The competitors may feel assured that their designs, if used at all, will be most scrupulously followed and all of the prize designs will be published in THE BRICKBUILDER.

ILLUSTRATED ADVERTISEMENTS.

IN the advertisement of the New York Architectural Terra-Cotta Company, on page xxvi, is illustrated the façade of the handsome new office building, built of brick and terra-cotta, for R. Hoe, Esq. Barney & Chapman are the architects. The adjoining illustration is of one of the caryatids, which are placed in the tenth story.

A handsome residence on Michigan Boulevard, Chicago, of which W. J. Brooks is the architect, is illustrated in the advertisement of the Celadon Terra-Cotta Company, Charles T. Harris, Lessee, on page xxiv.

The extension to the United States Hotel, Boston, Winslow & Wetherell, architects, is the subject chosen for this month's illustration in the advertisement of the Boston Fireproofing Company, page xii.

NEWCOMB MEMORIAL BUILDING, NEW ORLEANS, LA.

PLATES 19, 20, AND 24.— The H. Sophie Newcomb Memorial College Art Building, a two-story brick and terra-cotta structure of Italian Renaissance design, by Wilson Eyre, Jr., Architect, Philadelphia, Penn., is situated on the grounds of the college at New Orleans, La. This building was built among other old college buildings, and at the same time there were a number of old live-oak trees not to be disturbed; hence the shape of plan.

The basement, which is only slightly below the grade level, on account of the wet soil, contains lunch, dressing, and storage rooms.

The first floor, as the plan shows, is divided into rooms for oil painting, water-color painting, modeling, drawing, and draughting, each averaging in size 19 by 30 ft., and all opening into a main hall, with library at the northeast end of same.

On the second floor are two galleries 20 by 34 ft. each, used for exhibition purposes; two studios, life room, cast room, also suite of janitors' living rooms.

All the art working rooms on first and second floors have north light, and studios and art galleries are lighted by skylights.

CHICAGO ARCHITECTURAL CLUB.

CLASSES.

THE classes of the year will be kept up and meet as follows:— Every Tuesday evening will be devoted to the study of the regular problems in architecture.

The class in Pen and Ink Rendering meets every Thursday evening.

The class in Architectural Modeling meets every Friday evening.

The class in Sculpture and Drawing from Life meets on Saturday evening. This class is conducted jointly by this club and the Chicago Society of Artists.

The class in Water Color meets on Sunday mornings.

No tuition is charged for any of these classes.

The ninth annual exhibition of the club opened April 7.

The officers of the club are George R. Dean, president; Richard E. Schmidt, 1st vice-president; Myron H. Hunt, 2d vice-president; Frank M. Garden, secretary; Edward T. Wilder, treasurer.

PERSONAL.

CLARENCE P. HOYT, architect, has opened an office at 194 Boylston Street, Boston, Mass.

Architectural Rendering in Pen and Ink.

BY D. A. GREGG.

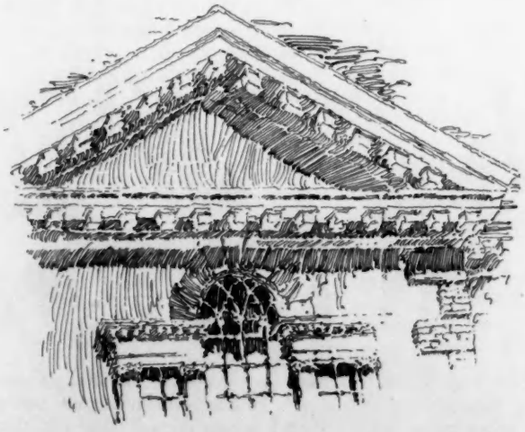
FROM A DRAWING BY MR. W. T. PARTRIDGE.

AWAY back in the seventies, while a draughtsman in an architect's office in New York, that liking for pen and ink rendering came over me which seems to strike nearly all young draughtsmen, and in course of time, by a kind Providence, an opportunity for constant practise was put in my way through an engagement with the *American Architect*. This was in 1879. One would be exceedingly dull not to learn many things about the work in sixteen years of practise, and a lesser number of years of effort to teach others how to render. But it did not take sixteen years to impress upon me one thing, viz.: that rendering in pen and ink was not the easiest thing in the world to learn. My failures taught me that very soon, and the failures and disappointments did not seem to let up at once. I would not care to go over the same ground again; it gives me a heart-ache to think of it. In my teaching experience I observe occasionally one who easily overcomes the various difficulties, and quickly comes to a fair amount of skill; but when one out of fifty does this, thirty have to work hard to get there, and the remaining nineteen never arrive.

The reasons are easily found, there is much to learn, and much time is necessary to learn these things. Some have abundant talent, but the time to practise they cannot easily get, as any draughtsman in an office understands. And some ought not to hope to acquire skill; their talent lies in another direction. A fair amount of natural talent is absolutely necessary.

A good pen drawing of a building should be as good as any other drawing by any other kind of an artist.

There should be no method peculiar to ourselves as architectural draughtsmen. Only we should indicate architectural detail better than other artists do.

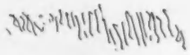


FROM A DRAWING BY MR. FRANK A. HAYS.

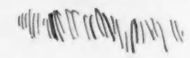
VERTICAL LINES IN COMBINATION.

Rude, clumsy, unfeeling.

Loose, liny, too widely spaced.



Weak, lacks spirit.



Thick and thin, disagreeable.

Broken, exceedingly bad.

Good, put together with some grace, variety in direction. United in a pleasant way.

INDIVIDUAL HORIZONTAL LINES.

Free hand, but so straight as to be wiry and unfeeling.

Too monotonous in its wave.

Broken; bad; usually needless.

Thick and thin in spots. Weak.

Of even thickness, undulating, has feeling. A good line.

An A1 architectural rendering should have the following qualities: —

1. Good drawing (perfect form in everything shown).
2. Excellent quality of line.
3. Agreeable combinations of line (technique).
4. Shade and shadow nature-like.
5. Value of black, white, and half-tone in right amount of each.
6. Values agreeably arranged (composition).

Each one of the above six items are a study in themselves, and in every drawing all must be considered every time. No wonder progress is slow and failure frequent.

Good drawing there must be. I do not know of any one who has become celebrated as an artist in any line of work who draws badly. And there are some whose strong point is their good drawing, who are loudly praised for their rendering.

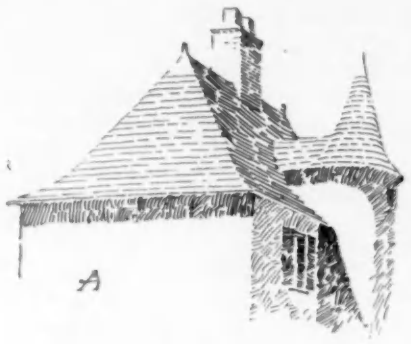
If you will look closely at the work of Daniel Vierge, you will see that his success is not so much in the rendering as in his perfect, magnificent drawing of form and detail.

Architectural draughtsmen sometimes fail to draw architecture well; but supposing this to be overcome, as it ought surely to be, what about accessories, foliage, and figures? Leaving figures out, which are often not missed, we cannot always omit foliage. We have spent years of study on architecture, and draw that properly; but, alas! on foliage we have not spent twenty-four hours, and trees need about as much study as architecture.

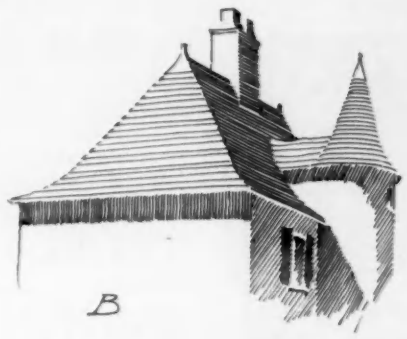
The outer form must be foliage-like, and tree shapes are so varied. The subject seems too large to be attempted in a brief article. But one hint let me give: select tree forms that are most agreeable, the maple, for instance, whose shape is full and rounding. Avoid sharp angles and rectangular shapes, which are unnatural. Make good use of the light holes that occur near the outer edges.

With all the difficulties belonging to foliage drawing, we nevertheless have in the architectural field some who draw foliage well.

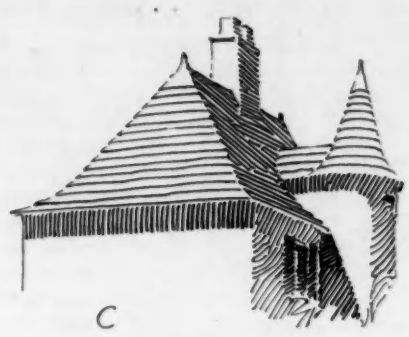
Architecture is not bereft of artists in drawing, whoever may say to the contrary. Observe this bit of shrubbery and grass, drawn by



BROKEN LINE. DISAGREEABLE SPOTTY EFFECT; A VERY COMMON FAULT WITH BEGINNERS. A SHORT BROKEN LINE IS A DANGEROUS ONE TO USE.



SEVERELY STRAIGHT, AND ON THE SIDE, ALL IN ONE DIRECTION. GENERAL EFFECT, HARD, DRY, MECHANICAL.



NOT A BAD DIRECTION OF LINE, BUT COARSE AND RUDE. THE LINE IS TOO PLAINLY SEEN.

Mr. P. G. Gulbranson. No mannerism or slightest suggestion of T square practise, but a skillful, dexterous, truthful rendering, to which any artist might be glad to lay claim.

In the *American Architect* of Feb. 17, 1894, Ventfort Hall is a beautiful example of Mr. Gulbranson's work, in which foliage and architecture are treated in a masterly way, faultless, it seems to me.

In foliage rendering, Mr. Bertram G. Goodhue also displays great skill, always good in form, happily introduced, and most skillfully executed.

Nothing but long, persistent practise will bring right results in foliage drawing, and it is greatly to the credit of any architectural draughtsman, with time-consuming office work on hand, to gain sufficient skill to draw foliage well.

A BIT OF FOLIAGE BY MR. P. G. GULBRANSON.

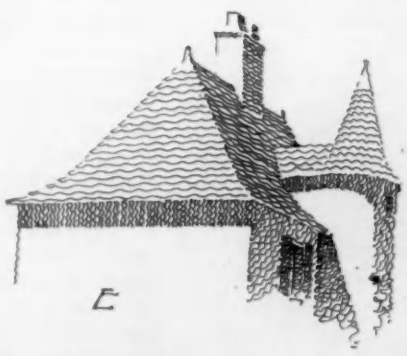
But I turn with interest to another phase of the work, which, by the way, strange to say, draughtsmen often fail to appreciate, — *quality of line*. The accompanying illustrations will explain. It was three or more years after my work was well begun before I realized the value of making the individual line a good one. But it is very easy to comprehend that as a drawing is made up of a great number of single strokes of the pen, it will make a great difference in the appearance of the drawing as a whole if the strokes are graceful or rude. All else being right, graceful lines will make a beautiful drawing. Yet I know some men of great skill, like E. A. Abbey, seem to make no special attempt in this direction, effect being the object gained by any sort of line; but, nevertheless, his line is never bad, only used as a means to an end. But there is no reason why additional interest may not be given to the work by making each line a line of beauty.

In the architectural field there is one who, in my estimation, has skill in this direction to a remarkable degree, — Mr. W. T. Partridge. I have taken the liberty to extract from one of his published drawings this bit of accessory which came in at the side of the house, illustrating well his most beautiful swing and grace of line.

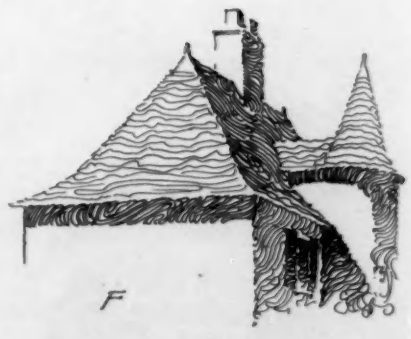
I do not see how the individual line could be made more perfect or combined with others in a more charming way. In his architecture, too, the same skill is shown. The *American Architect* of Oct. 28, 1893, contains a drawing by him, — Pavilion at Forest Park. There are two drawings with the same title. His drawing has a lady in the foreground. Mr. Partridge's modesty not permitting him to put his name to the work, I mention this. I look upon this drawing with great admiration. Its values and their arrangement are excellent, and through all his superior line gives a quality to the work which is delightful.

Another one of our architectural family, Mr. Frank A. Hays, has always greatly attracted me by his use of the line. It is a line perhaps a trifle less finished than Mr. Partridge's, but exceedingly good, full of feeling.

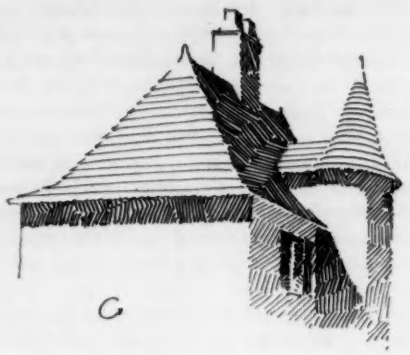
OVERDONE, LABORED, SCRATCHY. A METHOD REQUIRING SKILL, BUT CAPABLE OF EXCELLENT RESULTS.



LINE SO REGULARLY WAVED THAT IT APPEARS MACHINE-LIKE, MONOTONOUS. THERE SHOULD BE NO SUGESTIONS OF ANY PECULIAR LINE.



FREE LINE, RATHER TOO FREE; FANTASTIC. THIS METHOD SPEAKS TOO LOUDLY. KEPT WITHIN BOUNDS GIVES EXCELLENT EFFECT.



IN THE SHADE AND SHADOW, REGULARLY ZIGZAG, HARSH.

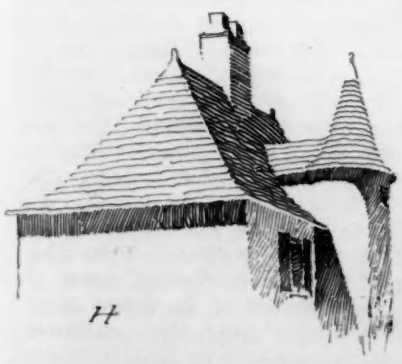
In speaking of the individual line, it is difficult not to consider at the same time the line in company with its fellows, its combination, the technique. Nevertheless, the two qualities are distinct, and may be considered apart. I believe the beginner should *draw* his line, not too slowly, but seek to make it perfect, and to do so there should not be haste; thought should go into every stroke. After long experience naturally the work will be done more rapidly, so rapidly, perhaps, that an observer might not discover any evidence of care, nor would the draughtsman himself be conscious of particular thought about the individual line, but thought there would be with quick execution gained by long practise.

A pen drawing or any other should appear to be easily done. Evidence of this must appear, not so much in the line as in its general technique. This subject of method, manner, style of rendering, or technique, is a large and interesting one.

The variety in style shown by various skilled draughtsmen is most interesting. After some experience in rendering, the individual traits of the draughtsmen are sure to be manifested. It would be interesting to inquire into the causes that lead to the formation of an individual style. Copying drawings early in one's experience has much to do with it. Some good may come of it, but it has the serious evil of hindering the formation of an individual method, which is so refreshing to observe. The best practise is to draw direct from nature as much as possible, to get natural effects of shade and shadow, and in the execution of these effects choose your own method. After attempts of this kind the student is in a condition of inquiry and interest as to how others do their work, and hints obtained then by observation are quite sufficient.

I know of only one general rule that should guide in this matter of method or technique. Assuming that our object is to present an agreeable picture of the subject with the best and most desirable effect of light and shade, *any peculiarity in technique that calls attention to itself unduly may be considered a fault.*

The few examples of rendering here submitted of the little housetop will illustrate my thought. Every one of these examples contain the germ of something good, and, if intelligently handled and modified, would be as acceptable as the one marked H. This one is by no means the only quiet reasonable rendering possible for it. Twenty experienced men would produce each their own, unlike his neighbors, and all might be equally excellent in result.



AN EFFORT TO AVOID A CONSPICUOUS METHOD, QUIET, UNOBTRUSIVE.

Notes on Design of Brick Buildings.

BY GEORGE F. NEWTON.

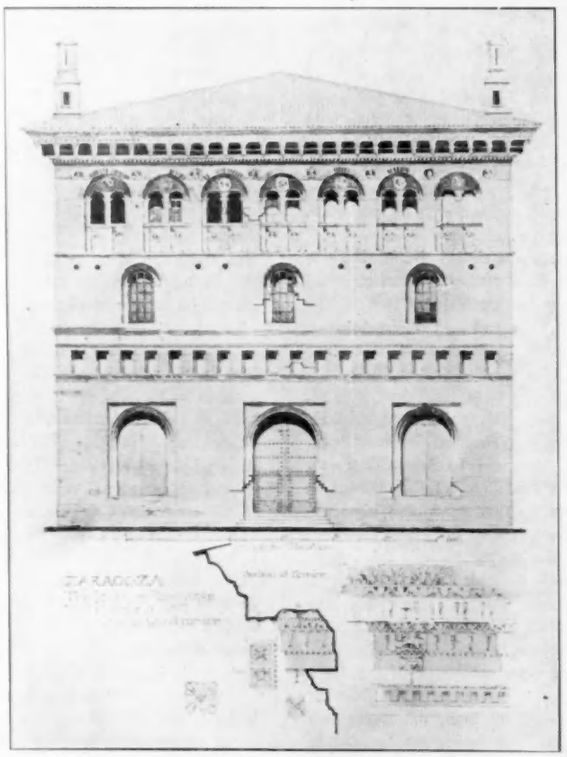
BUILDING and architecture are so interwoven that it is not always easy to draw the line sharply between them. There are few buildings which have not some pretense of being architectural. A simple brick building entirely devoid of ornamentation may, through some inherent quality, arrive at this effect. The result may be purely accidental, or, perhaps, carefully considered by an artist. We can readily call to mind such structures abroad and at home, which, from their size and fair proportions or color, with apparently no effort and no attempt at ornamentation, may be thus classed. As with all architecture, the composition of mass is the most important element. It is seen from far and near. In many cases the proportions of a building are largely governed by the requirements of the problem, and the architect is often sorely tried in preventing the practical difficulties from destroying his architecture. There is generally some creditable way out of the difficulty, and an architect has generally the excuse of inexperience or carelessness who permits a problem to get the better of him. Mistakes are too often made in attempting too much in the conception of a design. There is always a particular element or character in every building scheme, which, if the designer appreciates, can be played upon, and if treated in a masterly manner, however simply, will give the building a truly architectural character. If it is of great size, pleasing lines and masses may be sufficient; the money may be expended in giving these great surfaces an agreeable form rather than on ornamentation; a more pleasing sky line, or a heavier basement and cornice, or deeper reveals to the openings; such a mass may not actually require ornamentation, although its beauty would doubtless be much enhanced by its use. An ample mass, controlled by a sensitive hand, will make a building architectural in the grandest sense.

A large building, such as a warehouse, a manufactory, a tower, or a bold, simple dwelling in a rugged country, can be given added character by the use of heavy Roman brickwork. A very small building can be given a noble air by the use of a large scale material. The huts of the peasants in the Welch Mountains are made architectural by the use of large blocks of stone. It is a mistake often made to believe that the material of which a building is built should be necessarily in scale with it; namely, a large building constructed of large blocks, and a small one of small pieces. The reverse is more often true, for a small material cannot make a small object look large if it is really small, and the small scale of the wall units of a great object does seem to assist by comparison to increase its size. There is much beauty in a wall of our common red bricks with the usual ⅜ in. white mortar joint. When the bricks are well burned and deep in tone, and the wall is nicely proportioned with simple and studied breaks to give some play of light and shade, it may certainly be architectural. The individual bricks are lost in its vastness, and one complete agreeable whole is the result.

A well-known element of success in the practise of architecture is the appreciation of opportunities when they are presented. They occur to the architect frequently, and if one could get away from the feeling, "If I were only doing another kind of building, or if I could do this in some other material than the one imposed on me, I could make something of it," the result would often be better. The painter at work with the brush often feels that if he only had a piece of charcoal in his hand he could draw a thing just as he wants it, and *vice versa*. This is a common weakness of human nature to which the designer is a particular prey. There is a treatment of the problem in hand, in the material demanded, which will give the building some individual character and make of it a work of art; this, surely, is the architect's joy in his art, to take an intractable material and a difficult condition in plan and composition, and conquer both with intelligence and artistic perception. It perhaps requires more knowledge to do a good, simple architectural building. As a rule, the simple, unpretentious one gives the least offense, and

when the artist has produced a good, simple, architectural building he has proved himself decidedly more a master than one who is obliged to have recourse to ornamentation to call attention from poor composition. It is unfortunate, but true, that the majority of people consider a building as a work of art in proportion to its load of ornamentation; and it is evident from some of our atrocious modern façades, without a square foot of surface on which the eyes may rest, that some architects also believe an exhibition of this sort is architecture. The fault is not that a building is enriched; there are many buildings where a rich treatment is desirable and appropriate, but the principle of contrast in decoration is too little heeded in the revel of the modeler in a plastic material, beautiful of itself, ignored and shamed by fretting its entire surface with ornament which tells no story except extravagance and its adaptability to endless reproduction. This is one of the misfortunes of his indispensable material. It is indeed possible, and even usual, for men to sink into machines themselves, so that even hand work has all the character of mechanism.

The Italians, who were masters of the art of decoration, both external and internal, whether of encrusted marble or brickwork, have left us a wealth of examples which we would do well to study. As the lesson we learn from ancient Roman brickwork is one of construction rather than of design, the brickwork forming the ground for the encrustation of marble and stucco, it will not be considered in this article excepting as the organic form of the buildings is suggestive. There is much to be learned from Roman buildings in the way of composition and suggestive forms. Had the Romans not used marble or an encrustation of any kind, many of their edifices would be instructive from a point of view of composition which is as applicable to brick buildings as to stone. Many of their buildings could have been built entirely of brick and eminently architectural. Brick architecture does not proscribe the legitimate use of the marble shaft and entablature. On the contrary, the beauty of brick architecture is often enhanced by the employment of other materials. We do not object to the use of columns in the walls of the theater of Marcellus or in the Colosseum. The forms would be as good architecturally if all, save the columns and entablature, were of brick. Brick and marble have ever been employed together in the best periods of art. One assists the other. The use of the classical orders with a small material like bricks has been criticized on the ground that a brick building requires a system employing small blocks and should adhere to arched forms. This is logical and perhaps quite true. Its carrying out, however, would so limit the employment of bricks in our architecture that we must waive this objection, as we are obliged to do in many cases where esthetic questions run counter to positive requirements. We must not forget that architecture is the art, which taking up and admitting as conditions of its working the necessary and common uses of the building, must nevertheless impress on its forms certain characters dignified and beautiful.



The later Renaissance architects have produced good results in brickwork based on Roman buildings. From these ruins they learned to compose monumental forms. Bricks have been used in all styles of architecture in the Lombard of North Italy, the Renaissance of all countries, also in Gothic and Saracenic. These represent periods where brick architecture acquired the dignity of a style; where the ornamentation of brickwork arrived at that state of usefulness which permitted architects to use it in quantity. Plain bricks have ever been in use by all civilized nations, but it was only when a practical ornamentation of this material came into use that there was a brick architectural style as instanced by the North Italian and North German churches.

Architects should appreciate our own possibilities in brick architecture. It is only within the past few years that concerns like the Philadelphia and Boston Face Brick Company have made it practicable for architects to use Renaissance ornamentation to any extent in modern buildings. With many colored clays and a wide range of Renaissance forms, our brick architecture should equal if not rival in elegance the historic styles.

A well-studied composition, then, should not suffer for the lack of material, both in color and ornamentation, to make it at once elegant and refined. The study of composition of mass of a building is begun in one's student days and continued on through later practise. There are usually such a variety of conditions which seem to control the disposition of a modern building in silhouette as well as in plan, that perhaps the study of precedent is the most satisfactory way of acquiring a correct judgment of proportion as well as an acquaintance of suggestive solutions of difficult problems. A modern architect who has to deal with such a diversity of conditions should know all that historic precedent can teach him. As one of the dignities of architecture is its historic use, and since the latter is partly dependent upon its consistency of style, it would seem right to retain, as far as may be, the historic forms of the style adopted. The study of precedent is improving, each period of architecture supplying some valuable data. From ancient Rome we receive inspiration from imposing masses, great vaults and arches ("*Canina-Architettura Antica Romana*"). Vignola, Palladio, and the Tuscan architects found a rich field of suggestion in ancient Rome. Italy and Spain have produced many examples which were inspired primarily by ancient Roman work. Many buildings in Viacenza, by Palladio, would not look out of place in Rome. The Bourse and the Palace of Justice in Saragossa have quite the spirit and feeling of old Rome, with the bigness of scale and simple composition, most impressive and desirable qualities in architecture. Bruneleschi's dome is another of the results of careful studies of Roman ingenuity. Who is not impressed by the majesty of the great vaults of Constantine's Basilica, or by the ruin of the Baths of Caracalla?

After a study of Roman architecture an architect will strive for larger conceptions, he will realize that grand and simple forms

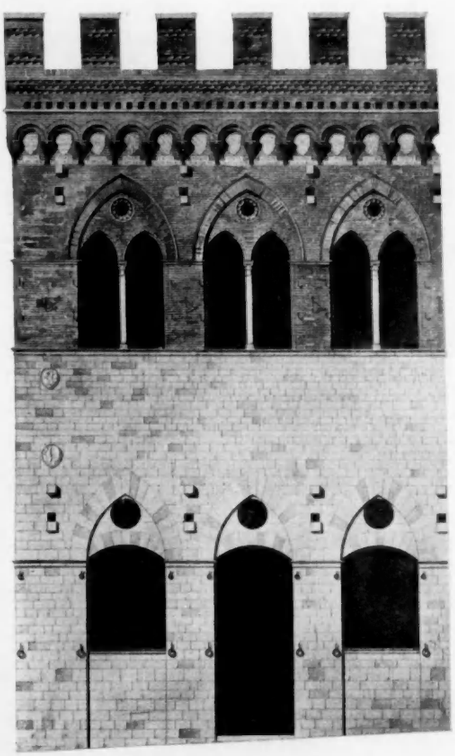
are vastly more telling than any quantity of surface ornamentation. The arch is the legitimate form with which to span an opening with small materials, and there is no place like Rome for the study of its treatment.

We learned from ancient Rome the value of monumental architecture. It is, perhaps, from later styles that a more direct help of a different sort is to be had. There is a quaintness and interest in the brickwork of the Basilican churches with round campanile of Ravena. The numerous Italian churches and brick towers of a still later period furnish an inexhaustible field of suggestion in composition and grouping. Descriptions of these buildings are not a fruitful source of help. A study of them on the spot is the ideal way of getting the greatest good from them. Illustrations must be made to serve in many cases, and these have been multiplied until there is abundant opportunity to study precedent and to supplement observations made abroad and at home.

It is desirable, in acquiring a knowledge of composition, to be conversant with the theories which have been formulated from the study of past successful buildings, and supplement this study by a discriminating and thoughtful study of precedent. If a designer would occupy his evenings at home sketching the acknowledged good buildings, illustrations of which are easily accessible in books and photographs, he would find that greater facility with his pencil, as well as much acquired sensitiveness of feeling for composition, would result.

There has been much variety in the use of bricks. In Assyria, they were used in walls, piers, and in arches sparingly, the openings being generally spanned with stone or wood. Here the art of brickmaking reached its highest degree of excellence. The remains of glazed brick in colors are one of the most interesting and beautiful productions of art in the past. The fragment of wall, now in the Louvre collection, built of enameled bricks with lions in merely low relief in rich and most harmonious colors, should be an inspiration to artists.

Italian architects from the eleventh to the fifteenth centuries perfected a style of brick architecture which is most interesting and worthy of careful study and imitation. (H. Strack, "*Zeigel Bauwerke des Mittelalters und der Renaissance in Italien.*") It is an excellent brick style which we can properly adapt to our own uses in developing our architecture. The early work of this period was strictly a brick style of building, stone being used only in such exposed positions where brick would not last, as for copings and sills stone columns and caps and bases were employed. Cornices were generally of brick; sometimes the wood rafters project to carry the protecting roof of tiles. Often a stone base or entire stone story is given to these buildings, with smooth face and horizontal courses varying in height. The masses of these earlier buildings do not lend themselves readily to our modern requirements. But there is the right sort of feeling of robustness, together with refinement, which one welcomes in external architecture, and a study of this medieval brickwork is intensely improving. Siena, S. Gimignano, Bologna, and other Italian cities are rich in examples of this period of buildings. Later, the buildings become more elegant, ornate moldings and patterns are stamped on the bricks, as seen in Piacenza and Cremona (Gruner), a truly artistic and logical treatment in brickwork, at once elegant, refined, and dignified.



PALAZZO GROTANELLI, SIENA.

Terra-cotta and marble were soon combined with brick, and developed into the rich and beautiful brick and marble architecture for which this period of art in Italy is renowned. Profuse in ornamentation and glowing with color, it is full of suggestiveness for our own architecture. (Gruner's, "*Terra-Cotta Architecture*"; Street's "*Brick and Marble Architecture of Northern Italy.*")

ENAMELED BRICK OR CEMENT?

UNDER the above heading in the issue of September, 1895, THE BRICKBUILDER urged the desirability of using enameled brick as a lining for the subway which is now being built in Boston. A recent inspection of the partially completed works shows that the position taken at that time was a correct one, and that the cement which is being used as a lining for the walls of the subway will prove neither satisfactory nor economical in the long run, without some form of expensive surface treatment. The work is, at present, in too unfinished a condition to predict absolutely the final conditions, but it is quite manifest that the cement will not only be dingy in appearance, but in view of the quantity of moisture which seems to be condensing on all the walls, it is hardly likely that the cement will stand as well as a vitreous surface. The cement absorbs water and consequently accumulates dirt. It is much more liable to sweat in extremes of weather, and the resulting moisture is of a character which is properly taken care of only with extreme difficulty. It is not yet too late to make a change and employ glazed bricks throughout, though their use at this stage of the work would necessitate considerably more expense than would have been concurred had they been decided upon in the beginning. The subway is too important a work to be slighted in any respect, and consideration of mere present economy ought not to weigh as against durability and a bright, cheerful appearance. Very few underground tunnels are pleasant to travel in, and anything which would contribute to making them lighter and more cheerful in aspect ought to be adopted. It would seem now as if the best procedure would be to line up all the walls with enameled brick, set off with an air space between back of the brick and the present cement facing so as to check in a very large degree the accumulation of moisture by sweating on the surface of the wall. This construction would give a bright, thoroughly clean appearance, and would go far towards offsetting the forebodings which we sometimes hear expressed that the subway will be unfavorable to the people because of its gloomy aspect.

ENGINEER.

AN occasional visit by draughtsmen to some well-established terra-cotta or brick plant would be the means of getting much valuable information on the subject and methods of clay manufacture. It has become popular in some localities to organize parties for this purpose, and such visits are always encouraged by the manufacturer.

Fire-proofing Department.

Conducted in the Interest of Building Construction to Prevent Loss by Fire.

EXPERT FIRE-PROOFING ENGINEER.

IN the last number of THE BRICKBUILDER was published a communication from one of our correspondents, calling attention to the fact that there is no generally recognized authority in this country on fire-proof construction, and suggesting that an expert fire-proofing engineer would not only fill a long-felt need, but would find ready employment for his talent in connection with our large commercial buildings. This thought is so manifestly in the line of progress that we hope it may stimulate some active, energetic young man to prepare himself, by study and experience, to understandingly and properly advise our architects and constructors as to the possibilities and limitations of fire-proof construction. An expert of this description, entering, as he would, upon comparatively untrodden fields, would have his own career to work out. It would perhaps be easier to say what he should not be, rather than to definitely prescribe his functions. He need not be an architect, though he should certainly have a very considerable architectural training, such as could be acquired only by observation of existing structures, and by intercourse with leading architects. He need not be an engineer by training, though he should have sufficient familiarity with the analytics of construction to be able to calculate in advance the strength of known mediums of building construction. The amount of mathematical training which is necessary for even the most extended architectural computation is in reality so slight that our fire-proofing engineer would not be called upon to be an expert mathematician. Nor need he be necessarily a builder; any more than an electrical engineer is necessarily obliged to serve an apprenticeship as a lineman. Our technical schools are full of bright, active, energetic young men, who are looking forward to winning a career for themselves. Architecture as a profession is rapidly becoming very much overcrowded, and advancement therein is in many cases a matter of personal influence and family connections. Civil engineering is a profession in which rise is very slow, and initial remunerations inadequate to the extensive preparation required. But if some young man, who, we will say, has completed the course in architecture at one of our technical schools, should give himself for three or four years to an earnest, exhaustive study of existing fire-proofing methods, including the practise not only throughout the length and breadth of this country, but also in Europe, and should acquaint himself thoroughly with the processes and capabilities of manufacturing fire-proof materials, he ought to be able to assume intelligently the position of consulting engineer for fire-proof work. The field to be covered in preliminary studies is not so large nor so varied but that our prospective engineer could cover it within the limits of, at the most, four years, and we at this moment know no professional opportunity which would be more sure of immediate pecuniary and personal returns than the line we have indicated. Fire-proofing is more of a study in this country than anywhere else, and we believe it is safe to say that in its most successful aspects it has achieved more success here than anywhere else. In certainly no other country has terra-cotta in its various forms been used so successfully to protect the elements of construction from the effects of excessive heat, and surely in no other country are the necessities of fire-proof construction so imperative. We call attention to our correspondent's letter and to these suggestions, in the hope that it may influence some young man to grapple with the problem, and by proper associations and experience become fitted to fill the want which we feel quite sure exists, and to apply the same species of scientific reasoning and deduction to fire-proof construction which has been so successful in the lines of electrical and steam work.

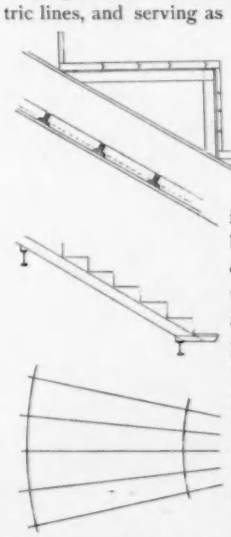
EDITOR OF THE BRICKBUILDER.

Dear Sir: — May I ask for some information? I am making plans for a public hall in this city, which it is proposed shall be fire-proof throughout in every respect. I want to use as little wood as possible in the finished construction. The distance between the beams is 2 ft. at the lower support and 3 ft. 9 ins. at the upper, the clear spans from girder to girder lengthwise being 15 ft. I enclose a diagram showing a plan of the beams. How can I best fire-proof these? These platforms are each 2 ft. 6 ins. wide, are to be level, and are to be floored with 1½ in. pine plank. The ordinary terra-cotta flooring blocks would not be practicable in this case, on account of the beams not being parallel and being set on a pitch, and I am at loss to know what is the best way to effect this construction.

What is the custom in Boston in regard to fire-proof stairways? I have noticed in Chicago that the stairs are usually built with iron stringers and slate treads, none of the iron being protected. As I understand it, one of the fundamental principles of fire-proof construction is that no structural metal work shall be exposed to the action of fire. Should the stair stringers not be protected in some way, and if so, what is the most practicable manner?

MILWAUKEE, April 10, 1896. S. J. C.

THERE are very few theaters so constructed as to afford proper security for the steel work of the sloping gallery beams. As our correspondent states, the ordinary floor blocks are not suitable. A better way is to fire-proof the floor with a species of roof construction, light T irons being suspended underneath the beams in concentric lines, and serving as supports for 2 in. or 3 in. book tiles which can readily be fitted to the warped surfaces. The webs of the beams can likewise be protected by light terra-cotta work. It is presumed that the platform boarding will be supported on brackets bolted to the top of the beam. The terra-cotta work can then be carried up to the under side of boarding, in each case leaving air spaces between each beam. This would probably be the least expensive method and would be sufficiently fire-proof for all purposes, especially if each air space is stopped off at intervals of 8 or 10 ft. This construction is shown by the diagram. Or, another method may be employed, involving somewhat more cost and a considerably heavier floor, but more durable in its character. The book tiles are put in as before and the spaces between the beams are filled with concrete made of cinders, so as to be as light as possible. The treads and risers of the platforms are then formed in concrete, finished smooth with cement, and the boarding is applied directly to the concrete without nailing, being held in place by a layer of asphalt or one of the compositions used for that purpose now on the market. In this construction the beams are entirely encased, there are no air spaces, and no possibility for spread of fire.



In regard to the staircases, the custom very generally is not to fire-proof them. This does not seem to us either logical or consistent. The stringers can be lathed underneath with metal lathing, and plastering applied of sufficient thickness to protect the ironwork. A better way, however, is to adopt the same construction indicated for the gallery beams, filling in between the stringers of stairs with terra-cotta resting on transverse T irons, and filling over the blocks with cement concrete, so that the slate treads will bed directly upon the cement. — ED.

Mortars and Concrete Department.

Devoted to Advanced Methods of using Cements and Limes in Building Construction.

AMERICAN CEMENT.

BY URIAH CUMMINGS.

CHAPTER VI. (*Continued.*)

THE CHEMISTRY OF CEMENTS.

NUMBER 15 of the table of analyses is selected for the next illustration.

As in the preceding table the inert matter is deducted, and the active ingredients are calculated to hundred parts, and placed in column No. 1.

No.	1	2	3	4	5	6	7
Silica	22.61	— 4.72 =	17.89	— 16.63 =	1.26	— 1.26 =	0.00
Lime	62.15	— 8.80 =	53.35	— 31.00 =	22.35	— 2.35 =	20.00
Magnesia	3.14	— 3.14 =	0.00	— 0.00 =	0.00	— 0.00 =	0.00
Alumina	12.10	— 2.68 =	9.42	— 9.42 =	0.00	— 0.00 =	0.00
Totals	100.00	19.34		57.05		3.61	20.00

Trisilicate of lime, magnesia, and alumina	19.34
Bisilicate of lime and alumina	57.05
Silicate of lime	3.61
Percentage of silicates	80.00
„ „ uncombined base	20.00
Total	100.00

The following is an analyzation of analysis No. 20 of the table of analyses.

The non-essentials being discarded, the analysis in hundred parts appears in column No. 1.

No.	1	2	3	4	5	6	7
Silica	28.96	—15.87 =	13.09	—00.54 =	12.55	—11.03 =	1.52
Lime	51.16	—29.58 =	21.58	—01.00 =	20.58	—20.58 =	0.00
Magnesia	10.89	—10.53 =	00.36	— 0.36 =	0.00	— 0.00 =	0.00
Alumina	8.99	— 8.99 =	0.00	— 0.00 =	0.00	— 0.00 =	0.00
Totals	100.00	64.97		1.90		31.61	1.52

Trisilicate of lime, magnesia, and alumina	64.97
Bisilicate of lime and alumina	1.90
Silicate of lime	31.61
Percentage of silicates	98.48
„ „ uncombined matter	1.52
Total	100.00

The analysis of a raw cement stone being given, and it being desired to reduce it to the percentages of silicates, which would appear after calcination, the following will be found an easy method for making the calculation.

Analysis No. 40 in the table is that of a raw cement stone, as will be seen in the reference table. The carbon dioxide was subtracted from the calcium carbonate for the sake of convenience in placing it in the table. The analysis of the stone is given in column No. 1 in the following table.

No.	1	2	3
Silica	17.50	17.50	28.92
Carbonate of lime	65.20 (lime)	36.51	60.34
Alumina	6.50	6.50	10.74
Oxide of iron	3.00		
Water and loss	7.80		
Totals	100.00	60.51	100.00

Column 2 contains the essential constituents, the carbonate of lime being reduced to lime. By reference to the table of chemical combinations, it will be seen that carbonate of lime is composed of lime, 56, carbon dioxide, 44; therefore $65.20 \times 56 = 36.51$ lime.

The essential constituents, as shown in column 2, are reduced to hundreds in column 3, and is shown in column 1 of the following table.

No.	1	2	3	4	5
Silica	28.92	— 18.95 =	9.97	— 9.97 =	0.00
Lime	60.34	— 35.34 =	25.00	— 18.58 =	6.42
Alumina	10.74	— 10.74 =	0.00	— 0.00 =	0.00
Totals	100.00	65.03		28.55	6.42

Bisilicate of lime and alumina	65.03
Silicate of lime	28.55
Percentage of silicates	93.58
„ „ uncombined	6.42
Total	100.00

Should carbonate of magnesia appear in the analysis of a cement stone, the amount of magnesia will be found by multiplying the carbonate by .476, as shown in the table of chemical combinations, and the product is placed in the column of constituent parts, as was done with the lime in the preceding table.

The following analyzations are taken from the corresponding numbers in the table of analyses, and reduced to hundred parts, the analysis appearing in column No. 1.

No. 47.

No.	1	2	3	4	5
Silica	21.48	— 13.71 =	7.77	— 7.77 =	0.00
Lime	70.75	— 25.57 =	45.18	— 14.48 =	30.70
Alumina	7.77	— 7.77 =	0.00	— 0.00 =	0.00
Totals	100.00	47.05		22.25	30.70

Bisilicate of lime and alumina	47.05
Silicate of lime	22.25
Total silicates	69.30
Free lime	30.70
Total	100.00

No. 48.

No.	1	2	3	4	5	6	7
Silica	22.35	— 1.76 =	20.59	— 9.99 =	10.60	— 10.60 =	0.00
Lime	69.82	— 3.28 =	66.54	— 18.63 =	47.91	— 19.76 =	28.15
Magnesia	1.17	— 1.17 =	0.00	— 0.00 =	0.00	— 0.00 =	0.00
Alumina	6.66	— 1.00 =	5.66	— 5.66 =	0.00	— 0.00 =	0.00
Totals	100.00	7.21		34.28		30.36	28.15

Silicate of lime, magnesia, and alumina	7.21
Silicate of lime and alumina	34.28
Silicate of lime	30.36
Percentage of silicates	71.85
„ „ free base	28.15
Total	100.00

No. 50.

No.	1	2	3	4	5
Silica	22.56	— 14.15 =	8.41	— 8.41 =	0.00
Lime	69.42	— 26.39 =	43.03	— 15.68 =	27.37
Alumina	8.02	— 8.02 =	0.00	— 0.00 =	0.00
Totals	100.00	48.56		24.09	27.37

Silicate of lime and alumina	48.56
Silicate of lime	24.09
Percentage of silicates	72.65
Free lime	27.35
Total	100.00

No. 52.

No.	1		2		3		4		5		6		7
Silica .	23.70	—	3.58	=	20.12	—	11.05	=	9.07	—	9.07	=	0.00
Lime .	65.63	—	6.67	=	58.96	—	20.60	=	38.36	—	16.91	=	21.45
Magnesia	2.38	—	2.38	=	0.00	—	0.00	=	0.00	—	0.00	=	0.00
Alumina	8.29	—	2.03	=	6.26	—	6.26	=	0.00	—	0.00	=	0.00
Totals	100.00		14.66				37.91				25.98		21.45

Silicate of lime, magnesia, and alumina	14.66
Silicate of lime and alumina	37.91
Silicate of lime	25.98
Percentage of silicates	78.55
Percentage free base	21.45
Total	100.00

The foregoing calculations sufficiently illustrate the system of calculating the percentages of silicates or active setting matter in a cement, or cement rock, from such analyses as are usually rendered by chemists and analysts. They also determine the classes of silicates which may be present and their percentages.

In a cement containing the three bases, lime, magnesia, and alumina, there may be found the three classes, namely, triple, double, and single silicates.

As has already been stated, a cement containing two or three silicates is superior in quality to that which contains but one.

To illustrate, let us suppose a cement to contain silica, lime, and alumina in exact combining proportions and forming a double silicate of lime and alumina, as in the following: —

Silica	29.14
Lime	54.34
Alumina	16.52
Total	100.00

Now if we take 8.00 from the alumina, and add an equal amount to the silica and lime in the proportions of 2.80 to the silica and 5.20 to the lime = 8.00, the new table will be formed as shown in column No. 1 below, and the double and single silicates will appear in the second and third columns respectively.

No.	1		2		3
Silica .	31.94	—	15.04	=	16.90
Lime .	59.54	—	28.04	=	31.50
Alumina .	8.52	—	8.52	=	0.00
Totals	100.00		51.60		48.40

Bisilicate of lime and alumina	51.60
Silicate of lime	48.40
Total	100.00

There can be no question whatever that a cement formed with the two classes of silicates, as shown in the latter table, will be superior in quality to that shown in the preceding table, which is due to the fact that in a cement, whether natural or artificial, lime is superior to alumina as a base, in the mortar of masonry or concrete, used either above or below water, and especially is this true in regard to masonry or concrete submerged in sea water.

No better demonstration of this fact is afforded than in the use of Tiel hydraulic lime, which contains less than 2 per cent. of alumina. Although this material contains a large percentage of uncombined lime, it has never been surpassed in its ability to resist the action of sea water, and those cements which have failed in sea water, whether natural or artificial, are found to contain a large proportion of alumina. Therefore, as shown in the last two tables, the alumina may vary 50 per cent. in amount, and still remain within the limits of true combining proportions, yet it is extremely probable; and further, it may be stated as an absolute certainty, that as between the two compositions referred to, the latter would, while the former would not, sustain continued immersion in sea water.

It seems desirable that some explanation be made or reason given for the position taken in regard to the combining ratio of the various silicates. To make a concise statement of the conflicting opinions concerning this vexed question, it is best to give them in the order in which they predominate.

First. Hydraulic cement is produced by the formation of silicate and aluminate of lime during calcination. Magnesia, if present, is inert or uncombined.

Second. By the formation of bisilicate of lime and alumina during calcination, magnesia, if present, forms silicate and aluminate of magnesia.

Third. The formation of silicate of lime during calcination, the alumina and magnesia remaining uncombined, or playing an unimportant part.

Fourth. That after calcination the constituents, silica, and whatever bases may be present, exist in a free state, and that by the application of water, a silicate is formed combining all the bases present in certain proportions; the excess, if any, is uncombined.

Fifth. Whether the material is natural cement rock or is artificially compounded, the formation during calcination of triple, double, and single silicates (dependent on the number of bases present), in certain fixed proportions, and any excess, whether of silica or the bases, remaining uncombined.

The preceding chapters, the table of chemical combinations, and that of combining ratios, is sufficient evidence of our belief in the correctness of the fifth proposition, and it is but just and proper to state that we are substantially alone in this belief.

The nearest approach to it is the opinion of Professor Cox, who, however, as shown by his writings, inclines to the fourth proposition.

Without wishing to arrogate any special knowledge of the art, or to attempt the building up of a new theory in relation to the chemical combinations existing in a cement, or contradictorily oppose the views of others on this subject, yet it is due to state that we find it impossible to accept many of the opinions given, such, for example, as that both silicate of lime and aluminate of lime are formed in a cement.

While it is true that aluminate of lime can be, and is, formed by the action of heat when these constituents are treated separately, that it can so form when in the presence of silica and lime, we do not believe.

We have already shown that alumina has both a basic and acidic character, although both are comparatively weak; and we believe that its acidic character entirely disappears when in the presence of the much more powerful silicic acid, and that when in the presence of that acid it can only assume the properties due to its basic character, and it therefore combines with silica in certain fixed proportions with lime and magnesia; and therefore when these three bases are present, with silicic acid, a combination is formed by the acid and the three bases in fixed and unalterable proportions, in accordance with the law of atomic weights.

There can be no doubt that if a mixture should be compounded which contained a small amount of silica and a large amount of lime and alumina, the excess of the two bases over and above their equivalents of silica would combine, forming aluminate of lime.

But inasmuch as that there are no known cements, whether natural or artificial, which contain alumina in excess of its combining ratio with the silica and lime present, it is needless to pursue this subject further.

That magnesia can remain uncombined when present with silicic acid and lime, or lime and alumina, is a theory which has been so often disproved, that it seems incredible that advocates of this fallacy should be found among the higher authorities, who claim that in an artificial cement more than three per cent. is not to be tolerated, while in natural rock cements it is uncombined, and therefore inert.

The Rosendale cements, which, in quality and general excellence, stand in the front rank among American rock cements, contain from 15 to 18 per cent. of magnesia. These cements are never

hydrated, being packed at the mill spout as fast as ground; and when used, are taken from the packages and mixed with sand and water, and immediately applied in masonry or concrete.

If the magnesia in these cements is in a free and uncombined state, as claimed by many writers, it must certainly follow that in the subsequent hydration, expansion and disruption of the masonry is inevitable. And so, if these cements are kept in packages any length of time, say three or four months, as often occurs in the hands of dealers in cements, the hydration of the free magnesia would certainly expand the packages and burst the hoops. And yet this distension of packages never occurs, and the idea of a disruption of masonry through the use of Rosendale cement is simply absurd. The millions of barrels of this brand of cement used in many of the greatest engineering and architectural works in the country, such as the high bridge over the Harlem, the New York and Brooklyn suspension bridge, the Croton aqueducts, the tallest buildings in lower Broadway, — in short, it may be said that New York and Boston are built with his cement, — and furthermore, the Akron, Milwaukee, Utica, and Mankato brands of cement, all contain practically as much magnesia as do the Rosendale brands; and yet there is no known instance of any of these brands ever expanding in masonry, and magnesian cements are used in this country to the extent of nearly five million barrels yearly. These facts alone stand as a complete refutation of the absurd theory that magnesia is free in these cements.

(*To be continued.*)

CONSUMPTION OF PORTLAND CEMENT IN AMERICA.

THE following statement, taken from the "Mineral Resources of the United States" recently published, speaks for itself: —

	1891.	1892.	1893.	1894.
Production of Portland cement in the United States.	454,813 bbls.	547,440 bbls.	590,652 bbls.	798,757 bbls.
Imports	2,788,313 "	2,440,654 "	2,674,149 "	2,638,107 "
	3,443,126 "	2,988,094 "	3,264,801 "	3,436,864 "
Exports		21,536 "	14,276 "	9,725 "
Total consumption	3,443,126 "	2,966,558 "	3,250,525 "	3,427,139 "
Percentage of total consumption produced in the United States	13.2%	18.4%	18.2%	23.3%

"From the above table it appears that the importation of cement into this country has remained nearly stationary since 1891, and that the domestic product has gained rapidly in comparison with the imported, until, in 1894, nearly one quarter of the Portland cement used was of American manufacture."

Of this 798,757 barrels produced in this country during the year 1894, 80 per cent. was manufactured in Pennsylvania, New Jersey, and New York.

Pennsylvania	437,106 bbls.
New Jersey	72,223 "
New York	117,275 "

The output of the Pennsylvania factories for 1896 will be double that of 1894.

One of the reasons given in this issue of the "Mineral Resources of the United States" for this great increase in the use of American Portland cement, was owing to the fact that it costs fifty cents per barrel less than the foreign cement. While this may be the case at some of the small Western mills located at interior points, where the freights are high from the coast, this reason will not answer for the cement manufactured in the East.

The writer knows from personal experience that cement made by leading German cement manufacturers is laid down at Philadelphia, New York, Boston, and Baltimore from ten to twenty cents per barrel less than standard brands of American Portland cement sell for in the same market, and the bulk of the Portland cement manufactured in this country, being made in the eastern part of Pennsylvania, Central New York, and New Jersey, finds its largest market in the large Eastern cities, where even the best grades of foreign cement frequently undersell them.

The freight rates from Pennsylvania and New Jersey factories to interior points, such as Detroit, Chicago, Milwaukee, and Duluth, were higher during the year 1894, by about ten cents per barrel, than the freights to such points on foreign cement from New York, and to St. Louis, Kansas City, Denver, and Salt Lake City, the foreign cement had an advantage in freight of twenty-five cents per barrel. So it can be seen that it is not because American Portland cement is sold cheap that its adoption is becoming so general all over the country for first-class engineering work; but its use is due entirely to the fact that the American product is, in most cases, superior to the foreign, and many engineers and architects prefer to use material manufactured at home, where they come in direct contact with the producer, and can hold him responsible for the character of the goods shipped.

Of the foreign countries shipping any large quantity of cement to the United States, that which comes from Germany alone can rank with the bulk of the American product for fineness, strength, and durability. Germany produced 12,000,000 barrels of Portland cement in 1894, and exported 2,400,000 barrels, of which a little less than 1,000,000 barrels came to this country. The fact that there was almost as much American Portland cement as German Portland used in the United States in 1894 will be a surprise to many who have been inclined to belittle the American Portland cement industry. These figures show that Germany consumed nine and one half million barrels of Portland cement in 1894.

With the adoption of concrete, which is fast becoming general for all classes of work in this country, it may not be rash to predict that the consumption will reach 10,000,000 barrels per year in the near future.

WM. G. HARTRANFT.

EDITOR OF THE BRICKBUILDER.

Dear Sir: — We are desirous of getting for use in half-timbered work a cement that will, after setting, be something near a creamy-white color.

If this color is not obtainable in cement in its natural state, what stain could be used that would be durable?

POUGHKEEPSIE, N. Y. SUBSCRIBER.

WE should be glad to acquaint "Subscriber" with the address of any manufacturer whose product would meet these requirements.— *Ed.*

REPLYING to a correspondent who has had difficulty in making a cement sidewalk retain a smooth surface, a writer in *Paving and Municipal Engineering* says: —

"While the top mixture should be thoroughly rammed or beaten and well troweled, yet this treatment should not be continued so long as to bring to the surface a considerable quantity of neat cement, thus leaving the layer of mortar next below without sufficient cement to bind it together. If this is done, the thin layer of neat cement may flake off when set, revealing a layer of almost clear sand below. A similar result obtains if one attempts to retrowel a surface once finished and partially set but afterward defaced. Sprinkling the walk before the cement has thoroughly set may cause blisters which mar the appearance of the work; on the other hand, the walk should be protected from the direct rays of a hot sun, or surface cracks may result."

THE following rules for the use of cement in freezing weather will be found useful: —

As little water should be used as will permit a thorough incorporation of the materials.

The water, sand, and stone may well be heated to about 100 degs. F., and in any case should be above 32 degs. F.

Salt may be used in small quantities to delay freezing until the work is in place, or in larger quantities to prevent freezing until the cement has set and hardened sufficiently to resist the destructive tendency of the freezing weather. — *Municipal Engineering.*

The Masons' Department.

Conducted in the Interests of the Mason and the Contractor for Brickwork.

THE ARCHITECT AND CONTRACTOR.

BY THOMAS A. FOX. (*Continued.*)

PRELIMINARY ESTIMATES.

THE first meeting of the architect and contractor on a given problem is usually for the purpose of making preliminary estimates. Although this work is informal, that is to say, not binding on the different parties concerned, it is none the less an important step in all building operations. Almost all mercantile structures, and many others, as theaters, hotels, and apartment houses, must be so designed and constructed that they will pay a certain percentage on the amount of capital invested. Once in a while it is true some wealthy individual undertakes, as a matter of personal pride, to erect a structure regardless of cost, and some of the insurance companies and rich corporations have done the same thing for the purpose of advertising, but these are exceptions to the general rule that such buildings will not be built unless they are profitable investments. The same limitation exists, but not so rigidly, in the case of public works, for these must usually be so planned that their cost will fall within such appropriation as may be available for the purpose. Church work comes under the same general rule, while domestic architecture has a less restriction in the amount which the owner thinks he ought to spend to satisfy his requirements. It is easy to see that the financial question is most important in the case of mercantile work, for the sole reason for its existence is that it may be a source of revenue to its owner; not that artistic considerations do not enter to a certain degree into the most prosaic commercial problems, but only incidentally. The matter of preliminary estimates is important but in a different way in the consideration of large public work, for in the first place the return in this case cannot be figured in dollars and cents, for in such work a considerable expenditure is necessary, and usually entirely justifiable to give the building proper architectural dignity, and to afford liberal and attractive accommodations to the legislative bodies and executive officers as well as the general public.

Important public work should be conceived and executed on as liberal scale as possible without waste or extravagance. It would be perfectly possible, for instance, to build a public library which would look like a mill on the exterior and barracks on the inside — no doubt books might be safely housed in such a structure, and the patrons and attendants might carry on their respective work in such a place free from physical discomfort, but no enlightened community would be likely to erect such a structure; if a building of that kind was proposed, we should at once hear people say that it would not pay, not meaning, of course, that it would not give a greater space enclosed within the four walls and roof than if the structure was laid out on a more liberal scale, but that there are other things to be considered in such a problem than simply to get the biggest thing for the least money. Of course in public works where utility or usefulness is the essential feature, as in the case of the various pauper and criminal institutions, hospitals, and the smaller municipal work, the financial limitations necessarily exist, as in the case of mercantile enterprises, but when the problem is a State capitol, a city hall, a court house, or a building of a similar character, then the people should be led in some legitimate way to appropriate enough money that the result may be worthy, not only from an architectural standpoint, but as setting forth the liberality and public spirit which should be found in the citizens of all progressive and enlightened communities.

We can thus see readily that preliminary estimates are necessary in almost all building projects, but for two distinct reasons: in the case of mercantile work to determine whether the proposed work is practicable; in that of civic and domestic work, to determine how much money will be required to carry out the problem in a satisfactory and proper manner.

Having now considered the objects of procuring preliminary estimates, let us look at the various methods of obtaining them, beginning with the most indeterminate cases.

Suppose there is a piece of land possibly covered wholly or in part with buildings, which yields under existing conditions a certain revenue, but there is reason to suppose if new buildings were erected the return would be considerably increased. Before undertaking the improvement of the property and running the risk of losing a certainty with the chance of doing no better even with a greater invested capital, the owner naturally wishes to know, first, the amount of expenditure which will be involved in the project, and then the essential facts, such as available area, etc., which will determine to a large extent the rental value of the improved property. Such a problem is usually studied, often before even sketches are drawn, by means of comparisons. Such comparisons were formerly almost always made by figuring the cost of buildings of similar classes at so much per square foot on the ground, but of late years the cubic unit is more universally employed, which gives quite accurate results, particularly in the case of large mercantile structures, involving no unusual structural or artistic complications, and for all practical purposes this method has proved to be accurate enough to obtain close approximate figures. To arrive at satisfactory results under these conditions it is necessary at the outset to adopt some uniform method of considering such matters as areas, light wells, and roof spaces, particularly if the figures used for executed work are taken from books or reports, for there are many different ways of estimating the relative cost of such unoccupied space, compared with the cost of the building proper. Care must also be taken to compare only buildings of a similar class; that is to say, where, in general, the construction, materials, and general scheme of architecture are identical both in the executed and proposed work. Such estimates are often made by the architect alone, but it is well to have the practical experience of a reliable contractor as well, and care must be taken to determine if the work under consideration can be carried out under the same conditions as that with which it is being compared. Locality and time often make a great difference in the relative cost of materials, and building laws sometimes require much more expensive construction in one city than in another; it is also unwise to compare the cost of buildings erected under different acts in the same municipality, as most of the laws are being constantly revised and made more stringent. The matter of insurance has of late become an important factor in the intelligent consideration of building projects. Not only have the regulations and inspections of the underwriters been made much more rigid and far-reaching than formerly, but a careful study of rates will often show that it will be more profitable in the end to erect a structure of higher grade or to adopt certain precautions against fire, which at first sight might seem unprofitable or undesirable. The season of the year at which the work is to be carried on, and the rapidity with which it is to be prosecuted, are also matters which effect in no small degree the relative cost of buildings; so it can be readily seen that this comparative method must, after all, be used with considerable judgment, and a full and accurate knowledge of the attending conditions if accurate results are to be reached. The matter of fixtures, that is to say, heating and ventilation, plumbing, elevators, and electric work, has become such an important item in the cost of a modern structure of any size, that it is well, even in preliminary work, to have such matters looked into in a general way by experts, and to have the assurance from them that the problem at hand calls for unusual expenditure in this direction which has not been considered.

The next stage in the development of a building project at which approximate estimates are usually obtained is after prelimi-

nary sketches have been made by the architect. The amount of definite knowledge which drawings under this title should convey is practically essential to form a reasonably accurate idea of the cost of any structure where the construction, the plan, and the artistic treatment are not all of the most simple and straightforward type.

It is therefore necessary, in the case of most public buildings and domestic work on any extensive scale, to obtain preliminary estimates under these conditions, for such problems vary one from another in so many important respects that the comparative method in itself is seldom accurate enough. It is still used, however, but in rather a different way and to a greater advantage here by the contractor than the architect. In this instance, after an examination of the sketches, the contractor makes a comparison of the proposed work as outlined with some existing building, the cost of which is known, and then by a comparison of superficial area or cubical contents arrives at an approximate figure. But this method is more often used merely as a check to the more definite result obtained by taking off the quantities from the drawings as accurately as possible and then figuring the cost in the same manner as would be done from complete working drawings, but, of course, without the absolute accuracy which could be obtained from them. Under this method there are many opportunities for the misunderstandings which so often occur in preliminary estimating, and which both the architect and contractor must be careful to guard against.

The difficulties which are encountered are briefly these: The owner, being desirous of keeping the architect within reasonable financial bounds, usually names as his limits the minimum price for which he thinks the work can be done. The architect, desirous of "nursing" his client, often assures him that the building can be built for the sum named, and, finally, the contractor in his turn, anxious to please both parties and feeling that any encouragement on his part will tend to put a new piece of work on the market, comes forward and agrees to figures and prices which his experience should have taught him cannot be lived up to when it comes to actually undertaking the work at hand.

Another important consideration which must be taken into account when making preliminary estimates is, that due allowance must be made for the natural expansion and elaboration of the problem which always occurs as the work develops, the responsibility of which is usually shared in common by the client and the architect. In presenting preliminary estimates to a client, it is necessary, if misunderstandings are to be avoided, to state just what is included and to what state of completion the building is carried. For instance, in the case of a public building, it should be specified whether or not the figure includes any allowance is made for decoration, sculpture, fixtures, or furniture which the client may consider, and with reason, are a constituent part of the building, but which the architect or the contractor, on the other hand, may have looked upon as after considerations. An important item which is often overlooked, strange as it may seem, is that of the architect's commission, and the total cost of more buildings than one would suppose it possible has been figured with the omission of this important item.

It is true, many architects and contractors justify in a measure preliminary estimates which are misleading, on the ground that if the truth were told at the outset, the figures would discourage the client from going on with the work, or that he would leave the architect who has been bold enough to present things in their true light and go to some one who would be willing to assure him that impossibilities can be accomplished. Though it must be admitted that after putting before a client estimates which have to be doubled or tripled before the work is completed, he is led by easy stages to spend in the end an amount he declared at first he would never assent to, it is, nevertheless, safe to say regarding preliminary estimates that honesty is the best policy, and if this principle was consistently followed by both architects and contractors, much of the feeling of distrust which now hovers over them would be dispelled and no one would suffer in the slightest; in fact, under existing conditions, other things being equal, those who state the facts to the best of their knowledge and belief come out best in the end.

In most well-conducted architectural competitions it is now customary to place some limits of cost on the proposed work by requiring the competitors to hand in with their drawings an estimate, signed by some responsible builder, which will represent the cost of the building. Of course, under these conditions, each architect gets the most favorable proposition possible, and as some contractors are much more obliging than others under such circumstances, if the matter of cost has been given as one of the factors which control the award, the judges should in all cases obtain estimates on all the designs under consideration made by the same person or persons, so that all competitors shall fare alike. In some competitions the estimate accompanying the drawings is required to be a *bona fide* bid from some reputable contractor, who agrees over his signature to build the proposed structure for the sum named. As such figures, however, are made up from what amount to mere sketches and outline specifications, besides the more important consideration that as a matter of fact no building is ever built without material changes from the competition drawings, the same opportunities for under-valuation exist as in the first instance, and therefore the same method of obtaining uniform estimates should be pursued as described above.

The ethics, or, to speak more plainly, the morals, involved in preliminary estimating are few and simple compared with those which arise in the more formal relations between the architect and contractor. As a rule, the time and experience which the contractor bestows on such work is given without compensation. To be sure, the familiarity which is gained by a thorough knowledge of a problem during the period of development and the insight into the various details of the plan and the construction which comes from constant consultations between the architect and contractor gives the latter a certain advantage over other competitors when it comes to making up the formal proposals. But, on the other hand, such knowledge often leads the contractor to be over-cautious, and, consequently, lose the job. And it is safe to say that for most of the time expended on preliminary estimating, the contractor receives no material return. It would undoubtedly be better if, on work involving any considerable amount of time and labor, the contractor could receive reasonable compensation; this would relieve the architect of a certain feeling of obligation and often a desire to show favoritism in making the final award. Under these conditions it may be assumed that the contractor would perform his work more thoroughly and conscientiously than at present, but the sentiment of the times which assumes that it is profitable and justifiable to get all one can for nothing will probably make it hard to institute a reform in this particular.

(To be continued.)

PLASTERERS' STEEL CORNER PLATES.

EARLY in the century men began to think about improving the corners of plastered walls. In looking over old buildings we find various attempts, all along the line, to strengthen the weakest part of the plastered walls. Numerous devices and expedients appear, showing the development of this thought for upwards of a hundred years.

Formerly corners were cased over with boards or molding. Then the English carpenters prepared a corner bead of wood, in form similar to the common picture molding, the top surface of the securing strip being chipped over to form clinches in the mortar. This was very generally adopted, and answered the demand in Europe and America until the advent of power machinery. Then came an overturn. The narrow lath took the place of the hemlock board, split and wedged apart for clinches, and the round rod displaced the corner bead.

Despite all that has been said against it, the rod is with us still, in common use, splitting the corner apart with two straight joints from top to bottom and shrinking away from the mortar in drying; everybody hates it; it is unarchitectural; the loose edges are always

falling to pieces; the carpenter is unable to miter his finish up to it; the paper-hanger seldom covers it smoothly; the painter wastes time and putty vainly trying to repair and decorate an awkward and mean construction. The best that can be said of the rod is that it furnishes a good harbor for dust and vermin and comes cheap. To oust this thorn in the flesh of architecture seems very simple, but its place must be filled with something better than cement or stucco; something that is easily handled, quickly worked up to, that stays put, and costs but little.

The cast-iron corner came in and went out. The gas pipe was drilled and screwed up, but the plasterer shook his head.

The tinker stripped his metal, folded it over a small wire, bent the flanges and nailed them to the corner, but the labor and patience in making them straight and preserving the alignment while the plastering was in process was too much for the vantage gained. Moreover, all these methods split the corner apart when it should be united or clinched.

The urgency for something better than mortar or wood has suggested steel to many minds, but the difficulty of manufacture, the cost of material, the energy and capital necessary to produce and distribute the goods in small quantities over the country, have stood in the way of progress.

Sometime in the early sixties, George Corbett, of Pittsburg, Penn., received the first patent ever granted for a metal corner plate. He probably made little or no use of that, for in December, 1872, he received a reissue that appears more feasible.

Against this, however, there must have been at that time just three difficulties: The high cost of metal, the impossibility of a proper manufacture, and the scarcity of men with sufficient patience to put it into a building on a plumb line. The corner under mortar was a good one.

Then came George Pagels, of Baltimore, patent April, 1874, with a strip of sheet iron so cut and formed as to grasp both sides of the corner. The difficulty of applying such a strip to a crooked wall is easily seen; should the nail draw harder on one side than the other, it would draw the blade towards itself and curve the outline.

The next to see the importance of this art and to aid in its development was George Dacunha, of Montclair, N. J., whose patent, dated December, 1883, aims at every possible form of perforated and bended sheet iron corners. But at this writing it does not seem probable that any of his inventions will come into general use.

The last patent on the corner plate was issued to a man who had long been familiar with the trowel, and who foresaw the essential features necessary to success; that it should be easily and firmly applied to the wall; that it should add little or nothing to the cost of the building; that it should furnish ample clinching spaces for the mortar to bend round the corner and unite the two sides of the plastering, and that it should furnish a faultless outline for the plasterer to work to, enabling him to do quickly and carelessly the most tedious part of his work.

The first, and perhaps the most important, quality to its general use was accomplished by adding to the plate a thin strip of furring, to protect it in handling and furnish sound nailing in putting it into the building. This may also be made as required to suit the various thicknesses of lathing and plastering. But the most difficult part in the manufacture of the plate was to get a true line 10 or 12 ft. long on the edge of a thin steel plate, warped and twisted in punching away more than half the weight of metal, and this, too, having a lateral bend of 45 degrees. Machines were made, altered, and thrown out, experts sought far and near. Advice was cheerfully received, and experiments thoroughly tested, but not until more than two years had passed was a satisfactory plate brought out. This was done by the Hamblin & Russell Manufacturing Co., of Worcester, Mass., who are now turning out several thousand feet daily.

The wholesale agency in New York City is making sales of 50,000 ft. and upwards in different parts of the country, and the patent has been allowed in several foreign countries.

The great advantage seen in this invention by the property holder is in the perfection of outline and permanency of the plastered corner. The plain, square, solid structure receives the embellishment of paint, paper, or fresco with better effect than the more ornate work. But the plasterers, with economic eyes, can see a great saving of time, the essence of all things. And the architect is relieved of much care and anxiety.

The plate was taken into the nineteenth triennial fair of the Massachusetts Charitable Mechanics Association the day the United States patent was issued, and the judges there saw fit to award a silver medal.

It has also received the indorsement of many of the most sturdy and conservative builders, who predict for it a permanent place in architecture.

THIS steel corner plate is fully illustrated in the advertisement of G. W. Meserve on page xxxii. — *Ed.*

EDITOR OF THE BRICKBUILDER.

Dear Sir: — Reading in your paper the remarks upon the whitening of brick, I venture to make some observations, founded upon actual experiments and chemical analysis made by myself.

I have only found two kinds of efflorescence, one consisting chiefly of bicarbonate of soda, which is generally much the most profuse and large in quantity, and of almost snow-white color. This, so far from being caused by the use of cement, would be greatly diminished and probably entirely prevented by the use of cement in place of lime, for the following reasons: —

It is caused by the use of brick made on the shore, and, therefore, from salt and brackish clay. The burning of this clay results in the reaction of silica, or sand, upon the salt in the presence of products of combustion containing hydrogen. The reaction gives silicate of soda, which remains in the brick, and hydrochloric acid, which passes off into the atmosphere. The writer has observed this acid in large quantity when passing such brick kilns. The bricks now containing silicate of soda in small quantity would not effloresce until laid in the wall, and would not effloresce even in the wall unless the mortar were alkaline; but in the latter case, which is, of course, much more common, the lime reacts upon the silicate of soda, forming caustic soda, which is very soluble, and which exudes on the brick and, coming in contact with the carbonic acid which is always in the air, becomes rapidly carbonated to bicarbonate of soda. It is obvious that in this case pure cement would greatly diminish the efflorescence if not entirely prevent it, for the reason that pure cement is only slightly, if at all, alkaline in its reaction.

The second kind of efflorescence consists mainly of sulphate of magnesia. This is of a grayer color, and is seldom or never found in large quantity such as the bicarbonate of soda efflorescence obtains. It is, in my opinion, generally, if not always, due to the presence of pyrites or some other sulphide in the clay before burning. The process of burning thereby produces sulphuric acid, which combines with the various other ingredients of the clay, forming probably sulphate of alumina, and, perhaps, some sulphate of iron. These bricks, when laid in cement which contains very considerable quantities of magnesia, will, of course, be more liable to efflorescence than when laid in lime mortar.

I am much interested in what Mr. Clark says of the use of linseed oil, and would gladly have him publish in your paper the theory on which this assistance from linseed oil is obtained, and, if possible, the experiences which have led to its adoption. I remain,

Yours very truly,

SAMUEL CABOT.

LARGE quantities of salt may be used with Portland cements in freezing weather without seriously injuring the mortar, and considerable amounts may also be used with natural cements. Portlands harden much faster than natural cements, and require less water for their manipulation; the former are very much to be preferred for use in freezing weather. — *Municipal Engineering.*

Recent Brick and Terra-Cotta Work in American Cities.

A Department Devoted to the Interests of the Manufacturer.

CHICAGO.— An event attractive to Chicago lovers of architecture was the annual exhibition by the Chicago Architectural Club, which was given in the Art Institute during the first ten days of this month.

The arrangement of the collection as a whole on the walls of the galleries gave a pleasing first impression, and the systematic grouping made one remember just where he wanted to go back on a second visit to study more thoroughly the photographs of the Boston Public Library, or some attractive feature of the Columbia College representation. The University of Pennsylvania School of Architecture contributed a long list of drawings. There were designs by members of the Sketch Club of New York, the Philadelphia T Square Club, and the Architectural Clubs of Detroit, Cleveland, and St. Louis. There were many notable designs showing the work of such architects as Wilson Eyre, Ernest Flagg, Mason & Rice, and J. A. Schwimfurth. The exhibition surpassed any previous one, and it was not necessary this year to fill up with elaborate displays of furniture and hardware. Home talent in this architectural exhibition was somewhat overshadowed by the good representation from abroad. One item of special local interest was the plan and a well-rendered water-color bird's-eye view of the treatment proposed by the Chicago Architectural Club for the new Lake Front Park. Filling in the lake front has actually begun, and Chicago now looks forward to what may be made, if properly handled, one of the finest parks in the world.

Let it be recorded that the contract to raze the old Post-Office and Government Building was let April 6, 1896, to a party who offered to tear down the pile and clear away the last of it within five months, and pay $47,300 for the privilege of doing it. Henry Ives Cobb, who was appointed architect of the new building, is getting his part of the work under way.

Just now brick and terra-cotta people are asking themselves if they are going to sit still while stone dealers (for it is said that they already are pulling the wires) tie up this important new building to their material for the exterior.

It is interesting in this connection to recall that a certain large office building in Chicago was to have an all-granite exterior, and, in obedience to the owner's wishes, drawings and calculations were made with that intention. But it was found, not only that the steel framework would have to be heavier and more expensive, and that the large excess of weight needed more foundation area than existed under the building, but that the stone could not possibly be obtained without serious delay. Terra-cotta was adopted, and one of the finest buildings in Chicago was put up, and made ready for tenants in eight months.

It would be a matter of regret if this new government building should keep up governmental traditions by failing to go up under the spirit of modern ideas. Light and air, space, beauty, and stability ought to have the same consideration in public or private hands. The difference between a wall 2 ft. thick and one 4 ft. thick is a large amount of floor space, worth to a tenant $2.00 per square foot in each story,— not to mention the cost of the wall.

Building news is a little more encouraging. The newsgatherer who haunts the architects says that many of them are busy, while other well-known architects find things a little slow.

One new office building is on the boards. D. H. Burnham & Co. are the designers. The structure will be 90 by 91½ ft. in plan, and will stand at the corner of State and Washington Streets, one of the finest locations in the city.

Dwight H. Perkins is designing a medical college building, to cost $40,000.

Holabird & Roche have alterations, a new front and so forth, under way for a Dearborn Street hotel. They have on hand also a wholesale building at the corner of Market and Congress.

The rest of the month's building news of importance (price being the criterion) is monotonous. Nelson Apartment Building, at Cottage Grove and Indiana Avenue, to cost $75,000.

Lehman apartment building, Clark and Fullerton Avenues, $110,000.

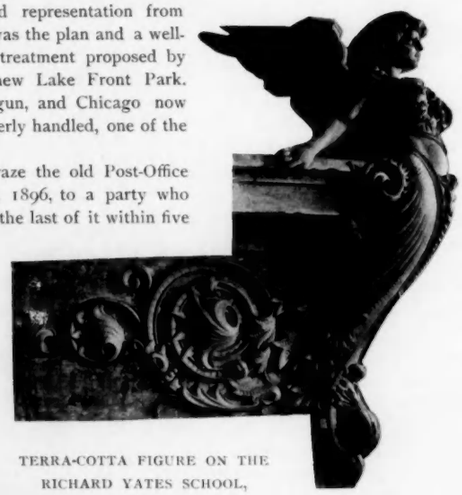
Two Follansbee apartment buildings near 23d and Wabash, to cost $300,000. I. C. Zarbell, architect.

Apartment building, 250 Madison Street, to cost $100,000. C. J. Furst, architect.

Apartment building on Dearborn Avenue, $100,000. G. S. Kingsley, architect.

The great majority of apartment buildings are four stories high, without passenger elevators.

Unlike some of the big apartment buildings which never get beyond paper, the $600,000 manufacturing plant designed by Treat & Foltz is to be a verity.



TERRA-COTTA FIGURE ON THE RICHARD YATES SCHOOL, CHICAGO.
A. FIEDLER, Architect.
Executed by the American Terra-Cotta and Ceramic Company.

ST. LOUIS. — This promises to be one of the quietest seasons we have had for some time, notwithstanding the fact that the permits issued shows more money is being invested in building than at any time during the history of St. Louis. The reason for this is that the three largest buildings ever built here have been started about the same time.

The Liggett & Myers tobacco factory, the largest plant of the kind, perhaps, in the world, is being done by Jonathan Clarks & Sons Company, of Chicago, and will cost, when completed, about one and one quarter million dollars. An immense army of workmen are employed, and it is being pushed in true Chicago style.

The same contractors have the Century Building, running from Olive to Locust Streets on Ninth Street, on the site of the old Pope's Theater. The building is to contain a theater, stores, and offices, and will cost something over a million dollars. It is of iron and steel construction, faced with marble. It is the first important building here, in which marble has been used on the exterior.

One block away from the Century Building is the Chemical Building, which already pierces the clouds, and will, within a couple of weeks, look down with disdain upon its fourteen-story neighbor, the Union Trust Building, which stands just across the alley. The building was designed by Henry Ives Cobb, and will be sixteen stories. The two first stories are of ornamental iron, and above of dark red brick and terra-cotta to match.

Some time ago there was an ordinance introduced into the city council to limit the height of buildings to 125 ft., which created quite a stir in architectural and realty circles, and provoked considerable opposition, but it seems to have gone the way of much other legislation in our city. After it got in the hands of the committee no more was heard of it.

A ray of hope has at last pushed itself through the cloud that has hovered so long around the new City Hall, and after much talk of scandal and corruption, and a farce of an investigation, an ordinance has been passed, which, although not officially, effectually deposes Architect Mann, and places the work in the hands of Mr. R. E. McMath, the president of the Board of Public Improvements, with a consulting architect, for which position Theo C. Link has been selected, and a corps of draughtsmen and inspectors has been engaged. Mr. McMath promises to push the work as rapidly as possible, and hopes to have the building finished within eighteen months.

HOTEL WALTON, PHILADELPHIA.
Angus S. Wade, Architect.

Work is progressing quite rapidly on the Auditorium Building, designed by Isaac Taylor, for the Republican National Convention. It is only a temporary building, being constructed on the south side of the City Hall lot, and is to be removed before winter.

Scarcely had the first shovel of dirt been thrown before there were whisperings of a general strike of the labor unions, owing to the employment by the contractor, R. P. McClure, of a sub-contractor for a small amount of the work, who does not work union men. Although the contractor promises the completion of the building on time, strike or no strike, any trouble of this kind would be particularly unfortunate. The building not being finished on time would mean much to St. Louis, and although much interest is always felt in the workingmen, any action of the labor unions which would cause delays would not meet with much sympathy from the public.

PHILADELPHIA.—If we are to judge the future by the present prospect, it would seem as if Philadelphia will have a year that will be a veritable record breaker; there have been an unusually large number of permits granted thus far, and there are amongst them some which call for very large buildings; there appears to be no end to the high building craze in this city, although it has so far not reached the extremes which it did in New York and Chicago. The highest thus far projected is to be located upon the site of the Girard House, and calls for sixteen stories; it will, however, not be built this season, but arrangements are being made to begin operations looking to the preparation of the usual preliminary work, in order that there will be no delay after the first of the next year, at which time the new parties will get possession. It is understood that the project is backed by New York capitalists, but to what use the building will be devoted has not been definitely ascertained.

Another project upon which estimates are now being made is a building for the Physicians and Dentists Association; it is to be for the use of physicians and dentists, and of the various uses pertaining thereto; the building, as at present planned, shows no advance above the usual methods and seemingly might be improved considerably, especially in the appearance of its exterior, which threatens to be about as near a copy of the old common cast-iron fronts as one could well make.

Messrs. Frank Miles Day & Bro. are engaged upon the preliminary work for the new building which the Baptist Publication Society will erect upon the site of the one recently destroyed by fire; the building will be entirely for the uses of the society and its kindred interests, and as at present contemplated will be ten stories high.

The Broad of City Trusts are having drawings made by Architect Windrim with a view of determining the possibilities of the site bounded by Twelfth, Eleventh, Girard, and Chestnut Streets; it is possible that there will be erected upon this site one immense building 400 by 220 ft., and not less than twelve stories in height. The first floor will contain from 24 to 30 storerooms, a large hall, and the necessary foyer and arcades. To what use the upper floors will be devoted has not been definitely decided, but the board have applications from several institutions for halls, apartments, and libraries, which will be considered; the Franklin Institute have applied for part of the building, as have also the trustees of the Public Library.

This site is one of the finest in the city, and it would be almost impossible to find one larger and better adapted to the requirements of the present day.

Architects will anxiously await the completion of the sketches, in the hope that they will add much to the advanced trend of building in this city.

But the worst is yet to come. There is a project on foot for rebuilding the Municipal Hospital in the suburbs of the city, and it would seem to be an unusually good opportunity to outstrip some of the similar efforts which are being made in this direction in other cities; but, alas! there comes forth some one in authority (I am pleased to say not an architect) who submits and presses the adoption of a scheme so very absurd that we are surprised that any of our daily papers should waste the space necessary to describe and show

CARNEGIE OFFICE BUILDING, PITTSBURG, PA.
Longfellow, Alden & Harlow, Architects.

a cut of it. It is proposed by these individuals to put up a building with an outer covering of galvanized iron, and an inner lining of the same material, the space between the two surfaces being filled with mineral wool or some other similar material. The advantages of this method of construction are not given in the article published, but it is said to be "just the proper thing" and will meet with "universal approval"; the most singular feature of the proposition, as far as we have been able to investigate, is, that it is not, as might be expected, the suggestion of either a dealer in mineral wool or a firm of galvanized iron workers.

HOTEL WALTON.

One of the important events of recent occurrence in this city was the opening of Hotel Walton, Angus S. Wade, architect. It occupies the site at Broad and Locust Streets, and its commanding presence is emphasized by three oriel towers, which, with a sloping roof, is covered with a handsome red tile furnished by the Celadon Terra-Cotta Company, Charles T. Harris, Lessee, Alfred, N. Y.

Their "Conosera" tile, which is especially adapted to the fitting of cones and all warped surfaces, was used. The design is an adaptation of the Moorish style of architecture. The first two stories are of richly carved brownstone and the upper stories of dark red brick.

The "Walton" is owned by Robert Goelet, of New York City, and is named in honor of his son.

PITTSBURG. — Since Pittsburg has lost the National Republican Convention on account of not sufficient hotel accommodations, she has come to her senses and quite a number of hotel projects are reported. One of these, for L. C. Phipps, is to be an eight-story building of brick and terra-cotta on Penn Avenue, from plans prepared by Architects Longfellow, Alden & Harlow.

Several warehouses are contemplated by the Denny estate on Grant Street near Seventh Avenue, to be six stories in height, slow burning construction, from plans by Architect T. H. Scott.

TERRA-COTTA DETAIL USED IN GUARANTY BUILDING, BUFFALO. ADLER & SULLIVAN, ARCHITECTS.
Executed by the Northwestern Terra-Cotta Company.

It is reported that Arbuckle Bros. & Co. will erect a six-story storehouse building on 31st Street, to be of steel frame construction filled in with brick and stone.

Architect T. D. Evans has prepared plans for a row of flats to be erected on Washington and Franklin Streets by a syndicate who will invest about $160,000 in the enterprise; to be eight stories high.

Architect Brady of the Department of Public Safety has prepared plans for a new engine house for the Fourteenth Ward.

Architects Rutan & Russell have prepared plans for an armory building for the National Guards, to be erected at a cost of about $250,000.

The St. Francis Hospital, 44th Street, owing to its being overcrowded, has decided to build an addition of brick and stone, to cost $35,000, from plans prepared by Architect S. F. Heckert.

It is reported that the West Penn Hospital will erect a large building at a cost of about $1,000,000.

There is also talk of building a new United Protestant memorial hospital for children, in Allegheny, to cost between $40,000 and $60,000.

Among the church projects may be mentioned a stone building for the Protestant Episcopal Congregation of the Ascension at Ellsworth Avenue, to cost about $75,000.

The St. Paul's United Evangelical Protestant German congregation will erect a new church building at First and East Streets, Allegheny.

The Third Ward Allegheny School Board contemplates the erection of a new school building, to cost about $340,000, to be three stories high.

The Washington Street Hebrew Synagogue will erect a new school building this spring, to cost $25,000.

ALBANY, TROY, AND VICINITY. — The casual visitor to Albany, Troy, and vicinity sees so little variety in the style of the various buildings that the impression is received that there is nothing, with possibly few exceptions, worth seeing in the way of architecture. But were that same person to make a systematic search, he would find a great many examples to examine and study, especially of that style which is so much in vogue at the present time, — viz, old Dutch colonial — and, would space permit, a list could be given which would be well worth one's time to look up and take as inspirations. Until within a few years, however, architects were so hampered by the wishes of their clients, who wanted a building like some one else had built, that it was almost an impossibility to design a building that would have any claims to artistic merit; but the time seems to have arrived when the people of this locality have wakened to the fact that it is possible to have their wishes complied with without any sacrifice to design, and we have now the commencement of a new era in building.

Among the recent buildings erected may be mentioned the Masonic Temple in Albany, by Fuller & Wheeler; the parish house of St. Peter's Episcopal Church, by R. H. Gibson, and many others.

In Troy, the Seminary Buildings, County Court House, Humane Society Building, by M. F. Cummings & Son; the Hart Memorial Building, by Barney & Chapman of New York, of which more may be said in a subsequent number; the M. E. Church Building in West Troy, by E. A. May; the City Hall, Cohoes, by J. C. Holland & Co., Topeka, Kan., and many other examples which space does not allow of a detailed explanation.

As spring comes in, the prospect for a busy season brightens daily and everything points to a very prosperous year in building.

Albany has in expectation two large bank buildings, with several other schemes of a lesser importance.

Troy will undoubtedly have a new Y. M. C. A. building, as several sites are held in refusal by the committee.

Taken altogether after a period of two years of inactivity, there will be a movement little less than a boom for Albany, Troy, and vicinity.

This statement is bourne out by a very substantial measure in sales and transfers of real estate.

ROCHESTER. — Building operations have improved considerably here of late. There is more work being done, and more about to be started, than there has been for some time.

The Security Trust Company will erect a new building, corner of East Main and Water Streets, for which Du Fais & Canfield, New York City, are the architects.

Boston, New York, and Baltimore architects have been asked to submit designs for a new church for the Saint Paul's congregation. It is understood that the structure is to be a costly one.

Architect J. Foster Warner has prepared plans for a five-story building to be built on the Sibley triangle for Hiram W. Sibley.

It will be of brick and terra-cotta, the latter supplied by the Perth Amboy Company.

Same architect has prepared plans for a three-story brick building for the Y. W. C. A.

Architects Walker & Briggs are preparing plans for a four-story block for Schaefer Brothers, on Central Avenue, 65 ft. front, of pressed brick.

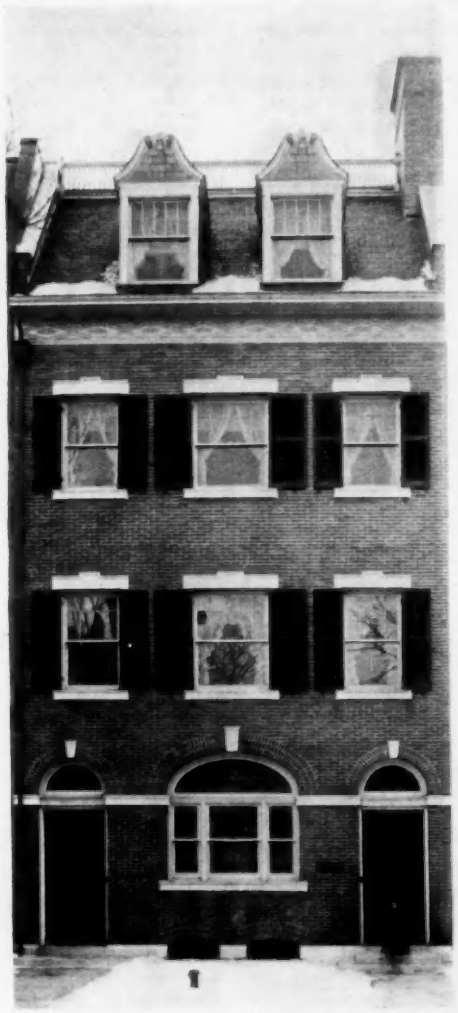
Architects Nolan, Nolan & Stern have prepared plans for a store and apartment building for Simon Goldsmith. Pressed brick front.

Architects O. K. Foote and Claude F. Bragdon have taken offices in the new Cutler Building.

COLUMBUS, O. — The indications are that this will be a very different year, in the building trades, from last year. All of the architects have work under way — some of them have quite large work. Mr. Linthwaite has plans completed for a business block for the Central Ohio Paper Company, to be 94 ft. front by 187 ft. deep, four stories high. It will be built of brick and terra-cotta, the front brick being gray. He has also completed plans for two fine residences, one for Mr. J. A. McCune, and one for Mr. M. J. Bergen. The former house will be built of Roman gray brick, and the latter of standard size gray brick. The two houses will cost $50,000 and $30,000, respectively.

Mr. Dauben has completed plans for a residence for Mr. L. Hoster, to cost $30,000, to be built of stone.

Messrs. Kremer & Hart report plans completed for the remodeling of the county children's home, to cost about $12,000.



A COLONIAL RESIDENCE, BUFFALO, N. Y.
Broughton & Johnson, Architects

Messrs. Mills & Goddard have plans out for a block of eight residences, for Judge S. N. Owen, to be built of buff brick and terra-cotta. The same firm have plans completed for residences for W. A. Schart and Dr. E. B. Jones.

DETROIT.— There has been a large amount of scandal in connection with the adoption of plans for the new court house for Wayne County. Several architects report having been approached by supervisors or their representatives; and one of the board — John Chris. Jacob — has been arrested on the sworn complaint of E. E. Myers and George W. Myers, who charge him with soliciting a bribe to influence the vote of the supervisors' committee. There are eight members of the committee, and the Myerses allege that Jacob required $8,000 previous to the vote to be divided among the eight; $4,000 more as soon as the architects' plans should be adopted, and $8,000 later; making $20,000 in all, or one half the architects' commission of five per cent. on an estimated total cost of $800,000. The examination of Jacob is set for April 10, and is looked forward to with great interest.

The hotel and Turkish bath house designed by Architects A. C. Varney & Co. for Gabriel Chiera is now an assured fact. The building will cost $50,000, and with all the bath equipment completed, $85,000. Messrs. Varney & Co. will also prepare the plans for a store and office building for George W. and Octavia Bates, to be built on the southwest corner of Woodward Avenue and Clifford Street. Same architects are preparing plans for a gorgeous ginger ale depot for ex-alderman James Vernor. The front of the building, which is on Woodward Avenue near Woodbridge Street, will be finished in white and gold, and the interior handsomely decorated and divided by rich art glass partitions.

Architects Mason & Rice have prepared plans for a warehouse for the Star Dockage and Storage Company. It will be of steel frame construction, 100 ft. square and three stories high. The exterior will be of pressed brick.

Thomas A. Hyland has prepared plans for an armory for the Detroit National Guard, to be built on Howard near First Street. It will be four stories high, of pressed brick and stone trimmings, and will cost $30,000.

Architects Spier & Rohns have designed a church edifice for St. Thomas Roman Catholic Society of Ann Arbor, Mich. It is of Gothic architecture, and will be constructed of field stone with cut brownstone trimmings and tile roof. Cost, $50,000.

Architects E. A. Walshe & Son have had their plans adopted for a three-story brick schoolhouse, 120 by 84 ft., to be built in Debray, a suburb of Detroit. It will be of buff pressed brick; cost, $20,000.

The Detroit College of Medicine will build a large annex to be used as a veterinary hospital, for which Architects Nettleton, Kahn & Trowbridge are preparing the plans. The exterior will be of pressed brick.

Architect Edward C. Van Leyen has designed several fine residences for J. R. & R. J. McLaughlin, to be built on King and Alger Avenues. They will be of pressed brick trimmed with ornamental, molded brick.

A six-story addition of brick is to be built on the Griswold House Hotel, for which plans are being prepared. The estimated cost is $50,000.

Architects John Scott & Co. have prepared plans for a fine residence for F. S. Case, on Virginia Avenue.

Fred T. Houk is preparing plans for a terrace for ten residences for Barr & Son, to be built at the corner of Theodore and Brush Streets. They will be of buff pressed brick, trimmed with Ohio buff sandstone.

Architect F. J. Grenier has plans for a three-story double residence to be built on Canfield Avenue, C. D. Lowrie owner; also a three-story residence for J. T. Hortung, Ferry Avenue.

MINNEAPOLIS. — There is considerable activity in the various architects' offices, and we feel confident of a fairly good year.

Work has commenced on a number of large structures, among them the $75,000 King warehouse.

It is proposed to resume work on the new dam, began last fall, below the present falls, and push it to completion. This means work for hundreds of men, and an expenditure of several millions of money. It is headed by our most progressive and energetic flour manufacturer, Charles A. Pillsbury, and represents considerable English capital.

There is another capitol competition "on" now, Montana being the State this time that asks architects to donate time and money to permit her commission to make a proper selection of plans and "planner" for her most important building. Judging from the circular of instructions issued to architects, it will probably be on a par with preceding competitions.

It is expected that the contracts for the foundations of our capitol building will be let so as to begin work by May 1.

The following buildings are among the list reported since last month. Architect H. W. Jones has planned a double store building for Stremel Bros., on Washington Avenue, North, 50 by 140 ft., two story and basement, pressed brick fronts, cost $10,000.

Same architect, plans for store building 50 by 100 ft., two story and basement, on Plymouth Avenue and Second Street, for Peter Faber, to have pressed brick front, cost $8,000.

Same architect, a residence at Linden Hills for C. W. Van Tuyl, 40 by 54 ft., two story and basement, buff pressed brick, to cost $8,000.

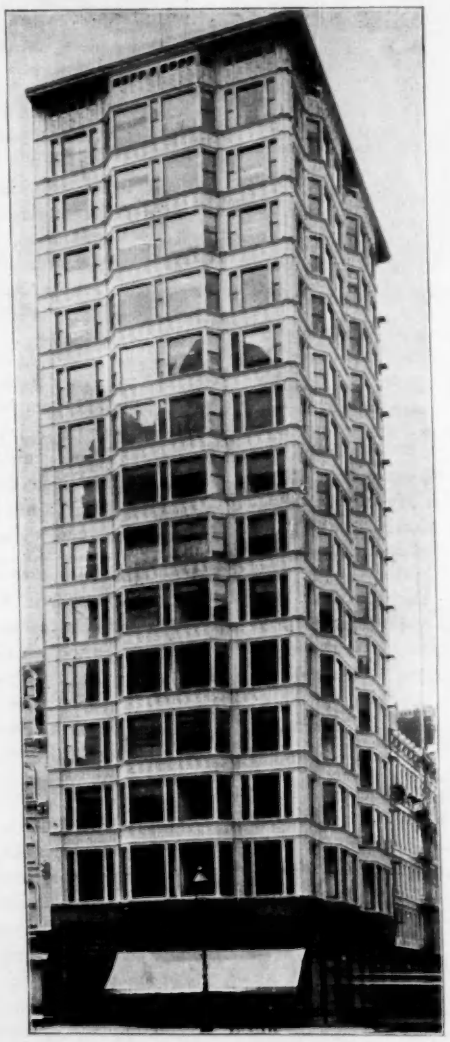
Architect S. J. Bowler, store building, 50 by 100 ft., at corner Washington Avenue and Cedar Street, three story and basement, pressed brick and stone, to cost $12,000.

T. B. Walker is building stores, 90 by 100 ft., three story and basement, red sand mold brick and brownstone, to cost $80,000, opposite Central Market.

Architects Orff & Jovalemon have planned a store building at Eau Claire, Wis., for H. C. Putnam, 82 by 105 ft., red pressed brick, to cost $25,000.

Same architects, a building for Citizens' National Bank, at Wahpeton, N. D., 25 by 80 ft., two story and basement, pressed brick and Ortonville granite, marble entrance, to cost $10,000.

Same architects, a church at St. Peter, Minn., for M. E. Society, 53 by 78 ft., to cost $10,000.



RELIANCE BUILDING, CHICAGO.
D. H. Burnham & Co., Architects.

Same architects, an eight-room school building at Lamberton, Minn., 72 by 75 ft., two story and basement, brick and stone, to cost $15,000.

Architect C. S. Sedgwick has planned a residence for M. W. Savage, on Portland Avenue and Twenty-sixth Street, 47 by 61 ft., to cost $10,000.

The only large undertaking reported from St. Paul this month, aside from the new capitol building, is the new Insane Hospital for St. Croix County, at New Richmond, Wis., by Buechner & Jacobsen, architects. Main building, 116 by 134 ft., with front wing, 44 by 57 ft., three story and basement, pressed brick with stone trimmings for fronts, to cost $50,000.

THE ESSENTIALS OF TERRA-COTTA CLAY.

THOSE who are desirous of making good terra-cotta should determine first whether their clay is suitable for the manufacture of such goods. This of course can be done empyrically or by trial, taking care, if the clay be gritty, to have it well washed and mellowed before being used for molding. A better plan, or shall we say one which gives results from a different standpoint, is to determine the composition of the clay. If such results be combined with those obtained by trial, we are likely to arrive at a satisfactory conclusion that is based on theory and practise.

The famous terra-cotta deposits at Watcombe, near Torquay, may well be taken as a standard of what fine clay for modeling and molding ought to be. This clay is superior in physical as well as in chemical properties. Its composition was ascertained by the late Mr. J. W. Ward to be as follows: —

Silica	57.83
Alumina	20.55
Peroxide of iron	7.75
Lime	1.68
Magnesia	0.97
Peroxide of manganese	trace
Carbonic acid	0.90
Potash	3.87
Soda	0.56
Phosphoric acid	trace
Absorbed water	2.13
Combined water	4.39
	100.63

The remarkable features are the nicely balanced percentages of the silica and the alumina, the low content of carbonates, the fairly high content of alkalies, and a fair richness in iron. It is doubtful whether the traces of manganese and phosphoric acid are possessed of any material significance. — *British Clay-worker.*

WATCH THIS COLUMN FOR POINTERS.

THE POWHATAN CLAY MANUFACTURING COMPANY, Richmond, Va., are putting a very handsome gray and gray speckled brick on the market.

THE NATIONAL BRICK COMPANY, of Bradford, Penn., report large sales of their brick through O. D. Person, of New York City, and Charles E. Willard, Boston, agents. They report that inquiries and orders for future delivery point to a prosperous trade. The size of their red press brick, which has found universal favor among architects, is 8¼ by 2½ by 4⅛.

THE ANTHONY ITTNER BRICK WORKS, of St. Louis, report a good trade during the past winter, which has not been severe enough in that locality to seriously interrupt building operations. This company is prepared to make special designs in brick, if given three or four weeks' notice. The Ittner factory is one of the oldest and best known in the country.

TIFFANY PRESSED BRICK COMPANY, Chicago, are supplying pressed brick for the new addition to Ashland Block, Chicago, and enameled brick for the A. H. Trude Building.

THE PHILADELPHIA & BOSTON FACE BRICK COMPANY, Boston, have recently shipped brick for two mantels, to Kioto, Japan; and for one mantel to the Sandwich Islands. Freight on these mantels is three or four times the value of the goods.

THE POWHATAN CLAY MANUFACTURING COMPANY, of Richmond, Va., are shipping their cream-white bricks to Washington, on the following jobs: four residences on Washington Heights, John H. Lane, contractor; five residences, same locality, William H. Kimmel, contractor; five residences, cor. 17th and R Streets, David M. Lea, owner.

MESSRS. HAM & CARTER, 560 Albany Street, Boston, are agents for the Dyckerhoff Portland Cement.

DYCKERHOFF PORTLAND CEMENT is now being used in the Boston Subway; also in the Siegel-Cooper & Co.'s stores, Sixth Avenue, New York City.

NEW YORK & ROSENDALE CEMENT COMPANY have recently closed a contract with the city of Providence through their agent, Mr. James C. Goff, to supply the cement that will be required by the Sewer Department during the year. "Brooklyn Bridge" brand, Rosendale Hydraulic Cement, will be used.

THE NEW YORK & ROSENDALE CEMENT COMPANY have had their cement specified on the following work: new Astor Hotel; Waldorf Hotel extension; Brooklyn Institute of Arts and Sciences; Columbia College, new buildings; Bowling Green Office Building.

THE POWHATAN CLAY MANUFACTURING COMPANY, of Richmond, Va., have opened a branch office in the Mohawk Building, 160 Fifth Avenue, New York City. F. H. S. Morrison, their sales manager, will have charge of this office.

IN the residence now being built in New York City, for Mrs. Mace, better known as Maggie Mitchell, cream-white bricks will be used, having a beveled edge. These bricks are being furnished by the Powhatan Clay Manufacturing Company. Same concern are furnishing their cream-white bricks for the new office building in Philadelphia, of the Mutual Life Insurance Company, of New York, P. W. Roos, architect.

THE PITTSBURGH TERRA-COTTA LUMBER COMPANY, Pittsburgh, have just closed a contract for a large amount of clay-working machinery for their new works to be located near Port Murray, N. J. At this factory they will manufacture ornamental building blocks, having secured the sole rights for the States of Pennsylvania and New Jersey, under the Durent patents.

TRADE literature of recent issue includes a pamphlet, "Hints on House Painting," and a series of cards showing five new shades of mortar colors, issued by William Connors, of Troy, N. Y., which will be sent on application. Mr. Connors reports that his plant is taxed to its fullest capacity, filling orders.

THE EMPIRE FIRE-PROOFING COMPANY, Pittsburgh, are supplying the fire-proofing for the new Siegel-Cooper Departmental Store, New York City. This is without doubt one of the largest, if not the largest, fire-proof building in the world. It has nearly 700,000 sq. ft. of floor space. This same company has recently closed contracts in St. Louis, Chicago, Detroit, Toledo, Buffalo, Philadelphia, and Washington.

THE COLUMBIAN FIRE-PROOFING COMPANY, of Pittsburgh, are furnishing the fire-proofing for the Massachusetts Fire-proof Storage and Warehouse Company, Boston, Mass., Andrews, Jaques & Rantoul, architects.

PERTH AMBOY TERRA-COTTA COMPANY are furnishing terra-cotta on the following contracts: Addition to the New York Life Insurance Company's Building, New York City, McKim, Mead & White, architects; building for the Metropolitan Telephone and Telegraph Company, Dey Street, New York City, Cyrus L. W. Eidlitz, architect; Edison Building, Atlantic Avenue, Boston, Winslow & Wetherell, architects; Church of the Sacred Heart, Lowell, Mass., P. W. Ford, architect.

CONKLING, ARMSTRONG TERRA-COTTA COMPANY, Philadelphia, Penn., are furnishing white terra-cotta for the Bowling Green Office Building, New York City, W. & G. Audsley, architects; gray terra-cotta for the Presbyterian Building, Philadelphia, Joseph M. Huston, architect; Pompeian terra-cotta for the St. Christopher's House, 88th Street, New York, Barney & Chapman, architects; Medico-Chirurgical Hospital, Philadelphia, Frank Miles Day & Brother, architects.

THE PIONEER FIRE-PROOF CONSTRUCTION COMPANY, of Chicago, are furnishing fire-proofing on the following contracts: Southern Express Company's office building, Memphis, Tenn., Weathers & Shaw, architects; the Uhline Building, Milwaukee, Charles Kirchoff, Jr., architect; the Trude Office Building, Chicago, Jenney & Mundie, architects; the Isolation Hospital, Chicago, De Wade, city architect; the Excelsior Brewery, Chicago, Lewis Lehl, architect; the Phipps Building, Pittsburgh, Longfellow, Alden & Harlow, architects; Wise County Court House, Decatur, Texas, J. Riley Gordon, architect.

THE FOLSOM SNOW GUARD COMPANY, Boston, have issued an illustrated pamphlet showing a dozen or more roofs that have been fitted with their New Model Snow Guards. They have recently furnished these guards on the following contracts: Sloan Maternity Hospital, and 88th Street Schoolhouse, New York City; City Hall in Cohoes, N. Y.; Fitchburg Railroad depot, Gardner, Mass.; fire station, and new high and grammar schoolhouses, Malden, Mass.

THE GRUEBY FAIENCE COMPANY, of Boston, have contracted for faience work in the New York, New Haven, Hartford & Railroad's new stations now being erected at Brockton and Campello, Mass.; Bradford L. Gilbert, architect. The color in this work is a delicate flush of pink — almost white.

They have also recently received an order for three special mantels for the Children's Hospital, Detroit, Mich.; Andrews, Jaques & Rantoul, architects. These are to be done in colors, the shades being cream yellow, blue, and green.

MESSRS. J. & R. LAMB, of New York, have recently completed a number of examples of mosaic work, in which the French enamel is being used very successfully. As this enamel is a ceramic mosaic, it should be of special interest to all of our readers. This particular medium is very desirable from two points: First, its great variety of color, and second, its absolute durability; each piece, being vitrified, is of the same density and hardness.

In the important mausoleum just completed at Woodlawn, the "Dunlop," one of the most elaborate of the new mausoleums erected there, this was used for the floor, a very important design of heraldic character, the coat-of-arms of the family being placed in the center of a richly bordered design. The colors, which were very rich, were added to by pure gold and silver "frit."

J. W. PENFIELD & SON, Willoughby, Ohio, have recently completed arrangements whereby they secure exclusive control of the Haigh continuous system of brick burning, and it will hereafter be known as The Universal Continuous Kiln. A distinguishing feature of this kiln consists in the adoption of side-firing, enabling them to secure the advantages of side-firing isolated kilns, with the economy in fuel secured by ordinary continuous systems of brick burning. This kiln is adapted for burning not only common brick, but also pressed brick, paving brick, fire brick, hollow ware, etc.

THE GOETZ BOX-ANCHOR COMPANY, of New Albany, Ind., have made an addition to their factory, the capacity of which will be at the rate of one hanger per minute. The hangers that they are now putting out are burnished and varnished, which adds much to their appearance. Recent shipments to Salt Lake City, Atlanta, Ga., and Worcester, Mass., would seem to indicate that they find a market in the whole United States.

PROPOSITION FOR COMPETITION.

HENRY A. GOETZ, of New Albany, Ind., inventor of the Box Anchor Post-Cap and Joist Hanger bearing his name, makes the following proposition: To donate to any architectural club the sum of two hundred dollars if he is not able to demonstrate that his methods of building, by the use of his inventions, are the best for certain kinds of work, especially warehouses, — the terms of the competition to be about as follows: —

1. The club is to make a plan of a warehouse, four stories, upon the slow-burning principle, in which durability, the arrangement of material, strength, and fire safety shall be the features, rather than ornamental design.

2. Goetz shall make a plan of the same kind, using his patented improvements as he intends they should be used.

3. All plans shall then be referred to a committee, composed of an architect, an insurance rate expert, and some person who owns or has built several large warehouses, and they will award the money to the best plan.

If Goetz gets the premium he must prove: —

1. That his method of building will get the lower rate of insurance.

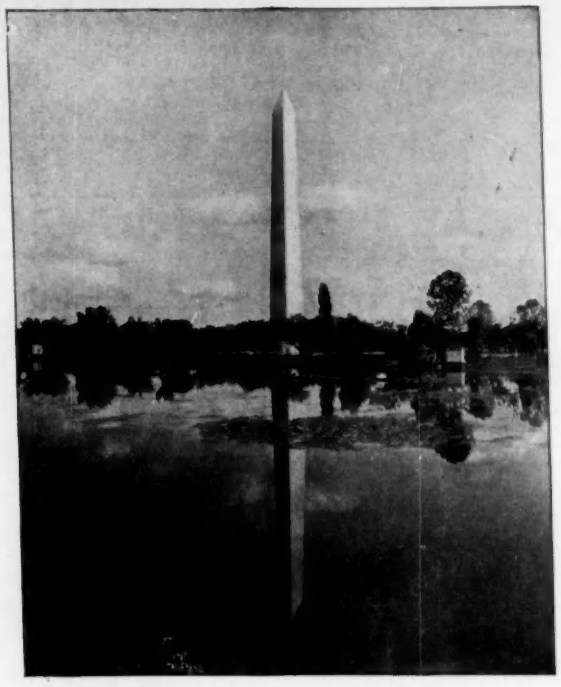
2. That his method is more durable and stronger than any competing plan.

3. That his plan of building will suffer less loss at a partial destruction by fire or wind than any competing plan.

4. That his improvements, used as a whole, will actually cost less money to build, or not more than competing plan next his in merit.

The entire membership of club being allowed to incorporate their ideas into their club plan, but not allowed to use any of the ideas advanced by Goetz in his printed literature.

WASHINGTON MONUMENT.



As the towering height of the **Washington Monument** exceeds that of all other similar structures in the world, so does the **"Triumph" Press** surpass all other Brick Presses as the Ideal of Perfection, in Simplicity, Durability, Capacity, and Money-earning qualities.

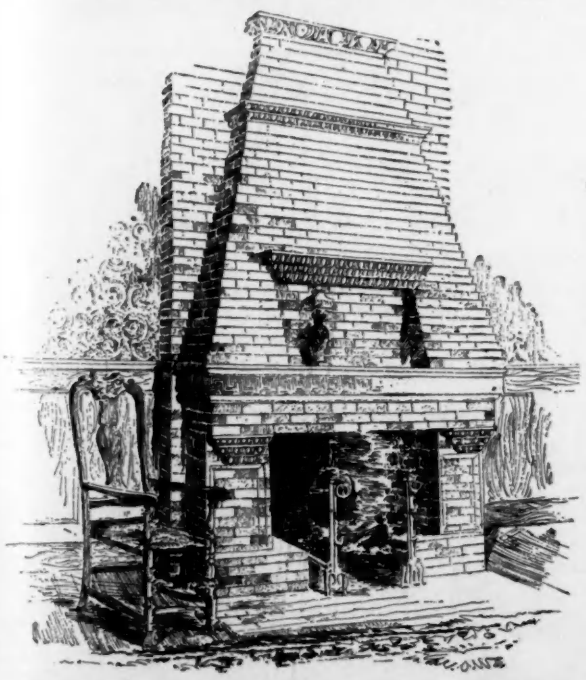
The **cost** of making **pressed bricks** on the **"Triumph"** is **less** than on **any other press** and **less** than by **any other known method** of making bricks, while the **quality** of its product is **unequaled.**

KULAGE MACHINE WORKS,

College Avenue, St. Louis, Mo.

We construct and equip brick plants of any capacity complete. We also manufacture the "Triumph" Gathering and Loading Machine — a money-saver and money-maker for the brickmaker. This machine gathers the previously plowed and dried clay from the field and loads same into carts or wagons. With two or three horses and one driver, its capacity is the gathering and loading of as much clay as twenty men with shovels would do. **The benefits to be derived of one machine are enormous.** Progressive brickmakers will please write us.

KULAGE MACHINE WORKS, COLLEGE AVE., ST. LOUIS, MO.



HERE IS ONE

Representation of a **FIREPLACE MANTEL.** Our Sketch Book, containing 39 others, will be sent you on application.

JUST THE THING

FIREPLACE MANTELS MADE OF MOULDED BRICK

In such Colors as Red, Cream, Buff, Pink, Brown, and Gray. These Mantels cost no more than other kinds, but are far better. They are easily set, and have a richness and simplicity of effect which is decidedly pleasing.

PHILA. & BOSTON FACE BRICK CO.,

No. 4 LIBERTY SQUARE, BOSTON, MASS.

DYCKERHOFF PORTLAND CEMENT

Is superior to any other Portland Cement made. It is very finely ground, always uniform and reliable, and of such extraordinary strength, that it will permit the addition of 25 per cent more sand, etc., than other well-known Portland Cements, and produce the most durable work. It is unalterable in volume and not liable to crack.

8,000 barrels have been used in the foundations of the Bartholdi Statue of Liberty, and it has also been used in the construction of the Washington Monument at Washington.

Pamphlet with directions for its employment, testimonials and tests, sent on application.

HAM & CARTER, 560 Albany Street, BOSTON.

E. THIELE, 78 William Street, NEW YORK, Sole Agent United States.

MANHATTAN CEMENT COMPANY,

21 TO 24 STATE STREET, - - NEW YORK.

IMPORTERS OF

"GERMANIA" (German Portland Cement).

Positively the best sidewalk cement made.

This statement is based upon reports from consumers throughout the country.

Germania was selected in preference to all others for use in laying the walks in front of the White House, at Washington, on account of its almost perfect color and great durability.

FOR CONCRETE FOUNDATIONS IT HAS NO SUPERIOR.

Pamphlets giving directions regarding mixture of sand for all kinds of work sent on application.

"GLOBE" (Belgian Portland Cement).

Tested by N. O. Olson, Engineer of Fairbank's Testing Dept., with the following results: Average tensile strength of five briquettes Neat Cement, seven days, **462 pounds per square inch.** Average tensile strength of five briquettes, one part Cement, two parts Sand, **172 pounds per square inch.**

The Globe Portland Cement has been furnished to the following contracts:—

Broadway Cable Road, New York City	40,000 bbls.
Foundation Terminal Warehouse, New York City	15,000 bbls.
Foundation Power House, Brooklyn City R. R.	15,000 bbls.
Baltimore Cable Road	10,000 bbls.

BERRY & FERGUSON, Agents for New England, Office, 102 State Street, BOSTON, MASS.

"With a true sense of economy we would buy nothing in Europe but of necessity. The gold reserves of our government and individuals would then increase without even the intervention of tariffs."

ALPHA · PORTLAND · CEMENT · COMPANY · MANUFACTURERS · ALPHA PORTLAND CEMENT · JAMES A. DAVIS & CO. SOLE N.E. AGENTS BOSTON, MASS.

Alpha Portland Cement

is the most economical. It is the finest ground cement on the market. For that reason it will take more sand and broken stone than any other cement in existence. To-day our best contractors and engineers consider it superior to any imported cement on the market. We guarantee every barrel of the "Alpha" to be uniform in quality, and to pass any requirement yet demanded of a Portland Cement.

WM. J. DONALDSON & CO., General Agents, Betz Building, Philadelphia, Pa.

JAMES A. DAVIS & CO., Sole N. E. Agents, 92 State Street, Boston.

ATLAS PORTLAND CEMENT.

WARRANTED EQUAL TO ANY AND SUPERIOR TO MOST OF THE FOREIGN BRANDS.

OFFICIAL TESTS, Nos. 3567 and 3568, made by the DEPARTMENT OF DOCKS, New York, March 31, 1894, being part of contract No. 464 for 8,000 barrels.

TENSILE STRENGTH, 7 days, neat cement	622 lbs.
" " 7 days, 3 parts sand to 1 of cement	332 lbs.
Parts steamed and boiled	Satisfactory.

All our product is of the first quality, and is the only American Portland Cement that meets the requirements of the U. S. Government and the New York Department of Docks. We make no second grade or so-called improved cement.

ATLAS CEMENT COMPANY, 143 LIBERTY STREET, NEW YORK CITY.

BURHAM BRICK LIME AND CEMENT CO. LONDON · BURHAM WORKS · TRADE PORTLAND CEMENT MARK · MURSTON WORKS

"Burham"

ENGLISH PORTLAND CEMENT celebrated for Reliability, Chemical Purity, Great Strength, High Sand Carrying Capacity and General Uniformity. Quantity imported yearly far greater than any other brand.

For Sale by **BERRY & FERGUSON,** OFFICE, 102 STATE STREET, BOSTON, MASS.

CIMENT PORTLAND DE LA SOCIETE J. & A. PAVIN DE LAFARGE A VIVIERS (Ardeche) FRANCE

"Lafarge"

French Portland Cement, the only material to use for setting, pointing, and backing LIMESTONE and GRANITE.

Will not stain and makes the strongest binder.

James Brand, Importer, 81, 83 Fulton St., NEW YORK. 34 Clark St., CHICAGO.

ALSEN'S PORTLAND CEMENT.

The strongest, finest ground, and most uniform Cement in the world. Permits the admixture of more sand than any other, and is the best for mortar or stuccoing.

143 LIBERTY STREET - - - - - - - NEW YORK.